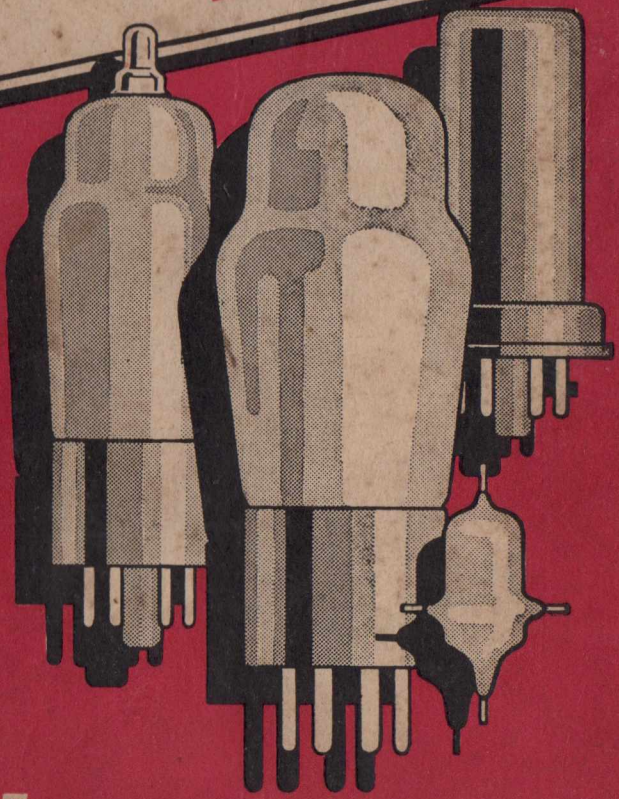
RADIO VALVE EQUIVALENTS MANUAL

BRITISH, AMERICAN, CONTINENTAL AND SERVICE TYPES

BERNARD B. BABANI



No 67

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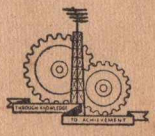
RADIO VALVE EQUIVALENTS MANUAL

British, American, Continental, and Service Types.

BERNARD B. BABANI.



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American Type	Brimar Micromesh Standard	Clarion	Cossor	Dario
			210DG	
			210PG 210SPG	BK22
		VHP2	210VPT 210VPA	PF472
			210SPT	PF462
			210SPT	
	5B1	SG2	215SG 220SG	TB622 TB422
		VS2	220VS 220VSG	TB452
	HLB1		210HL	
		H2	210HF 210RC	TB282
			210DDT	
				BBC12
		HL2	210LF 210DET	TB172 TB102
	PB1	P2 LP2	220P 220PA	TB122
			215P	TB052
		PX2	230XP	TB032 TB032A TB062
	PenB1	PN2	220HPT 220OT	TC432 TC432N TB432
			220PT 230PT	TCH432

Ekco	E.T.A.	Ever-Ready	Ferranti	Fotos
		K50N		
		K80A K80B	VHT2 VHT2A	
		K50M		
	BY6	K40B		
		K40N	VS2	
		K30C K30K K30D		
		K30A		
		K23B		
		K23A	H2D	
	BY1815 BY1210	K30B K30D		
		K30E	L2	
	BW1304	K30G		
	BX604			
	BW602			
	BY3	K70B	PT2	

Graham Farrish (Ring)	Hivac	Lissen	Marconi Osram	Mazda
			DG2	
		FC2	X21 X22	
VP2	VP215	SP2V	VP21 W21 KTW21	VP215 VP210
HP2	HP215	SP2	Z21 KTZ21	SP215 SP210
			W22	
			Z22	
SG2 SX2	SG215 SG220 SG210	SG215	S21 S22 S23 S24	SG215 S215 S215A S215B
VS2	VS215 VS210	SG2V	VS24 VS24K VS2	S215VM
		HL2	HL2 HL2K	HL2
	H210	H2	H2 H210 HL210 DEH210	H2 HL210
	DDT220	L2D	HD22, HD24 HD23 HD21	HL21DD
	DDT215			L21DD
DX2	D210		L210 DEL210	
LF2	L210	L2	L21	L2
LP2	P220	LP2	LP2	P220
MP2	P215	P220	P215 DEP215	P215
XP2	PP220 PX230	P220A P240A PX240	P2 P2B	P220A
PT2	Y220	PT225 PT2A	PT2 KT2	Pen220
PP2	Z220	PT240		Pen220A

	Miniwatt Dario	Mullard	Philips	Pix	Record	
1		PM1DG				1
2		VP2B				2
3	KH1		KH1			3
4		FC2			OC2	4
5		FC2A				5
6	KK2		KK2			6
7		VP2			VHP2	7
8						8
9						9
10		SP2				10
11					HFP2	11
12						12
13						13
14						14
15	KF3		KF3			15
16						16
17						17
18	KF4		KF4			18
19						19
20		PM12		25	S2	20
21	B262	PM12A	B262			21
22						22
23						23
24		PM12M				24
25		PM12V			VS2	25
26						26
27		PM1HL	B228			27
28		PM2HL				28
29		PM2DX				29
30	KC4		KC4			30
31		PM1A		2	H2	31
32		PM1HF		4		32
33						33
34						34
35						35
36	KC1		KC1			36
37		TDD2A			DDTR2	37
38						38
39						39
40		TDD2				40
41	KBC1		KBC1			41
42		PM1LF	B217	3	L2	42
43					DL2	43
44						44
45		PM2DL				45
46						46
47	KC3		KC3			47
48		PM2A		20	LP2	48
49						49
50		PM2		120	P2	50
51						51
52		PM202		230	SP2	52
53		PM252				53
54						54
55		PM22	C243N		PT2	55
56		PM22A				56
57						57
58	KL4		KL4			58
59						59
60						60
61						61
62	KL1		KL1			62
63		PM22C				63
64						64

	Six-Sixty	Telefunken	362	Triotron	Obsolete etc., Tungsram	
1	S210DG	RE702d			DG210	1
2						2
3		KH1			KH	3
4				O202	MH_06	4
5						5
6		KK2			TKK2	6
7	SS218VP		VP2C	S217	HP211	7
8			VP2		HP215	8
9					HP221	9
10	SS218HP			S218	HP210	10
11					HP210n	11
12					HP212	12
13					HP220	13
14				S209		14
15		KF3			TKF3	15
16						16
17				S210		17
18		KF4			TKF4	18
19						19
20	SS215SG	RES092	SG2	S215	S210	20
21	SS218SG	RES042		S207	S220	21
22		RES182				22
23						23
24	SS 15VSG		VS2	S213	SE211	24
25	SS218VSG			S208	SE220	25
26					SV220	26
27	SS210HL		HL2	SD2	PD220	27
28					PD221	28
29						29
30		KC4			KC4	30
31	SS210HF	RE502	H2	W213	H210	31
32	SS210RC	RE102		WD2	R208	32
33						33
34						34
35						35
36		KC1			TKC1	36
37	SS210DDT			DT215		37
38						38
49						39
40						40
41		KBC1			TKBC1	41
42	SS210D	RE602	L2	TD2	L210	42
43	SS210LF	RE06		HD2		43
44				A214		44
45					G209	45
46					LG210	46
47		KC3			TKC3	47
48	SS220PA		LP2	YD2	PL215	48
49				YD02		49
50	SS220P			ZD2		50
51						51
52	SS220SP		SP2	UD2	P220	52
53	SS240SP			SP2	SP230	53
54				E235		54
55	SS220Pen			P215	PP222	55
56	SS230Pen			P225	PP220	56
57					PP230	57
58		KL4			TKL4	58
59						59
60						60
61		RE112				61
62		KL1				62
63			ME2			63
64			ME2A			64

	Tungsram	Valvo	Visseaux			
1	DG210/0					1
2	VX2					2
3	VX2s	KH1				3
4	VO2					4
5						5
6	VO2s	KK2				6
7	HP211c					7
8						8
9						9
10	HP210nc					10
11						11
12						12
13						13
14	VP2B					14
15	VP2Bs	KF3				15
16	VP2D					16
17	SP2B					17
18	SP2Bs	KF4				18
19	SP2D					19
20	SS210					20
21						21
22						22
23						23
24	SE211c					24
25						25
26						26
27	HL2					27
28						28
29						29
30	HL2s	KC4				30
31	HR210					31
32						32
33						33
34						34
35	HR2					35
36	HR2s	KC1				36
37	DDT2					37
38						38
39	DDT2A					39
40	DDT2B					40
41	DDT2Bs	KBC1				41
42						42
43	LD210	A206				43
44						44
45						45
46	LL2					46
47	LL2s	KC3				47
48						48
49	LP220					49
50						50
51	P215					51
52						52
53	SP220					53
54						54
55						55
56	PP2					56
57						57
58	PP2s	KL4				58
59						59
60	PP2101					60
61	PP215	L215				61
62	PP215s	KL1				62
63						63
64	PP225					64

	American Type	Brimar Micromesh Standard	Clarion	Cossor	Dario	
65						65
66			B22	240B	TB402	66
67			B24	220B		67
68						68
69						69
70						70
70a						70a
71						71
72						72
73					BLL32	73
74				240QP		74
75				220TH		75
76						76
77				220DD		77
78				2XP		78
79		9A1				79
80					TE474	80
81		9A1		MVS/Pen	TE564	81
82		8A1		MS/PenA	TE464	82
83				41MPT		83
84				MS/Pen		84
85				MVS/PenB		85
86						86
87					TF64	87
88		9A1		MVS/Pen	TE474	88
89				MS/PenB		89
90						90
91					TF44	91
92			ACVS	MVSG	TE554	92
93		VSGA1				93
94			ACSG	MSGHA	TE424	94
95				MSGLA	TE524	95
96		SGA1		41MSG		96
97		HLA1	ACHF	41MH	TE384	97
98		HLA2		41MHF	TE244	98
99				41MHL	TE994	99
100				41MLF		100
101				41MRC		101
102						102
103						103
104						104
105						105
106						106
107		DDA1	ACD	DD4	TB24	107
108				DDL4		108
109						109
110						110
111						111
112		11A2		DDT	TBC14	112
113						113
114						114
115		PA1	ACL	41MP	TE094	115
116				41MXP		116
117						117
118						118
119		7A2	ACPN	MP/Pen	TE634	119
120					TE534	120
121						121
122						122
123		7A3		42OT, PT10	TL44	123
124				42MP/Pen		124
125						125
126						126
127						127

	Ekco	E.T.A.	Ever-Ready	Ferranti	Fotos	
65						65
66			K33A	HP2		66
67						67
68						68
69			K33B			69
70						70
70a						70a
71			K70D			71
72						72
73			K77A			73
74				QPT2		74
75						75
76						76
77						77
78			S30D			78
79						79
80						80
81			A50N	VPT4B		81
82			A50A	SPT4A	T4600	82
83						83
84						84
85						85
86						86
87			A50P			87
88			A50M		T4700	88
89						89
90						90
91			A50B			91
92		DW8	A40M			92
93					T4500C	93
94		DW6			T4500	94
95		DW7			S4150	95
96					S4150E	96
97	T41	DW1508	A30B	D4	T425	97
98		DW4011	A30D		S440N	98
99		DW4023				99
100						100
101						101
102						102
103						103
104						104
105						105
106						106
107			A20B			107
108						108
109	2D41					109
110						110
111						111
112	DT41		A23A	H4D		112
113						113
114						114
115						115
116					T410	116
117						117
118						118
119			A70B			119
120						120
121						121
122						122
123	OP42		A70C	PT4		123
124			A70D			124
125						125
126						126
127						127

	Graham Farrish (Ring)	Hivac	Lissen	Marconi Osram	Mazda	
65						65
66		B230	BB240		PD220	66
67						67
68						68
69			BB220A	B21	PD220A	69
70			BB240A			70
70a				VS24K		70a
71				KT21	Pen231	71
72				KT24		72
73					QP240	73
74				QP21	QP230	74
75				X23		75
76				X24		76
77					DD207	77
78				PX2	PA20	78
79				VMP4		79
80				VMP4G		80
81					AC/VP1	81
82		AC/HP		MSP4	AC/SP1	82
83					AC/S2Pen	83
84						84
85				W42		85
86						86
87					AC/VP2	87
88				VMP4	AC/VP1	88
89						89
90						90
91					AC/SP3	91
92	AC/VS	AC/VS	ACSGV	VMS4	ACSIVM	92
93	AC/VG			VMS4B	ACSGVM	93
94	AC/HG	AC/SH	ACSG	MS4	ACSG	94
95	AC/SG	AC/SL		MS4B	ACS2	95
96						96
97	ACDX	AC/HL	ACHL	MH4	AC/HL	97
98				MH41	AC2/HL	98
99				MHL4		99
100						100
101						101
102						102
103						103
104				H42		104
105						105
106						106
107		AC/DD		D41	V914	107
108					AC/DD	108
109						109
110						110
111						111
112		AC/DDT		MHD4	ACHLDD	112
113				DH42		113
114						114
115	AC/LP	AC/L		ML4	AC/P	115
116					AC/P1	116
117					AC/P4	117
118						118
119	AC/PT	AC/Y		MKT4	AC/Pen	119
120				N42		120
121				MPT4		121
122				KT42		122
123	AC/PP	AC/Z	ACPT	KT41	AC2/Pen	123
124				N41	AC5/Pen	124
125						125
126						126
127						127

	Miniwatt Dario	Mullard	Philips	Pix	Record	
65	KL2		KL2			65
66		PM2B	B240		BB2B	66
67						67
68	KDD1		KDD1			68
69	B240	PM2BA	B240			69
70						70
70a	B255	MM12A	B255			70a
71		PM22D				71
72						72
73		QP22A				73
74		QP22B				74
75		TH2				75
76						76
77		2D2				77
78		ACO42				78
79						79
80						80
81	AF2	VP4A	AF2			81
82	E446	SP4	E446		AC/HFP	82
83						83
84						84
85						85
86	AF3		AF3			86
87		VP4B			AC/VHPB	87
88	E447	VP4	E447		VHFP	88
89						89
90	AF7		AF7			90
91		SP4B			AC/HPB	91
92		VM4V	E445		AC/VS	92
93	E455	MM4V	E455			93
94	E452T	S4V	E452T			94
95	E442	S4VA	E142		AC/S	95
96	E442S	S4VB	E442S			96
97	E424N	154V	E424N	90AC	AC/NHL	97
98	E438	164V	E438	100AC		98
99	E499	244V	E499			99
100		354V				100
101		484V				101
102		904V				102
103		994V				103
104						104
105	AC2		AC2			105
106	AB1	2D4	AB1		AC/DDHA	106
107		2D4A			AC/DDHA	107
108						108
109		2D4B				109
110						110
111	AB2		AB2			111
112		TDD4			AC/DDTR	112
113						113
114	ABC1		ABC1			114
115		104V, TT4	E409			115
116	E409N	054V	E409N			116
117						117
118	AL2		AL2			118
119		Pen4V			AC/PTA	119
120	E463	Pen4VA	E463		AC/PT	120
121						121
122						122
123		Pen4VB			AC/PT4VB	123
124		PenA4				124
125	AL3		AL3			125
126	AL4		AL4			126
127						127

	Six-Sixty	Telefunken	362	Triotron	Obsolete etc., Tungsram	
65		KL2				65
66	SS220B		BA2	E220B		66
67						67
68		KDD1			TKDD1	68
69			BX2			79
70		RE402B				70
70a						70a
71						71
72						72
73						73
74						74
75						75
76						76
77						77
78						78
79						79
80						80
81		AF2		S434	HP4115	81
82		REN$_{S}$1284		S435N	HP4101	82
83					HP4100	83
84						84
85						85
86		AF3			TAF3	86
87				S420		87
88		REN$_{S}$1294		S434N	HP4105	88
89						89
90		AF7			FAF7	90
91						91
92	SS4VMAC	REN$_{S}$1214	ACVS4	S415	AS4104	92
93	SS4MMAC	REN$_{S}$1274			AS4105	93
94	SS4SGAC	REN$_{S}$1264		S410N	AS494	94
95	SS4XSGAC			SCN4	AS495	95
96	SS4YSGAC	REN$_{S}$1204		S430N	AS4100	96
97	SS4DXAC	REN904	ACHL4	A440N	AG495	97
98	SS4GPAC	REN1004		W415N	AG4100	98
99	SS4LAC	REN914		AN4	AR495	99
100	SS4HLAC	REN804		SN4	AR4100	100
101				A430N	AR4101	101
102				WN4	QR4120	102
103						103
104						104
105		AC2			TAC2	105
106		AB1				106
107				D400		107
108						108
109						109
110						110
111		AB2			TAB2	111
112	SS4DDTAC		ACHL4DD	DT436		112
113						113
114		ABC1			TABC1	114
115	SS4PAC				AP495	115
116	SS4SPAC	REN1104			AL495	116
117						117
118		AL2			TAL2	118
119	SS4PenAC	REN$_{S}$1374	ACME4	P441N	APP4100	119
120		RES1384d		P440N	APP4120	120
121					APP4130	121
122						122
123	SS4PenAAC			P495		123
124						124
125		AL3			TAL3	125
126		AL4			TAL4	126
127						127

	Tungsram	Valvo	Visseaux			
65	PP225s	KL2				65
66						66
67	CB215					67
68	CB215s	KDD1				68
69						69
70	CB220					70
70a	SE220					70a
71						71
72						72
73						73
74						74
73						73
75						75
76						76
77						77
78						78
79	HP4105					79
80						80
81	HP4115c	AF2				81
82	HP4101c	H4128D	RS4346			82
83						83
84						84
85	VP4					85
86	VP4s	AF3				86
87	VP4B					87
88	VP4C	H4129D	RS4347			88
89	SP4					89
90	SP4s	AF7				90
91	SP4B					91
92	AS4125	H4125D				92
93		H4115D	RS4345			93
94	AS4120	H4111D	RS4342			94
95		H4100D	RS4142			95
96		H4080D	RS4142N			96
97	HL4+	A4110	RS4324			97
98		W4080	RS4238			98
99		W4110				99
100		H4100				100
101						101
102						102
103						103
104	HL4g					104
105	HL4gs	AC2				105
106	DD465	AB1				106
107	DD4					107
108						108
109	DD4D					109
110	D418					110
111	DD4s	AB2				111
112	DDT4					112
113						113
114	DDT4s	ABC1				114
115	LL4					115
116		L4100	RS4309			116
117	LL4C					117
118	APP4As	AL2				118
119	APP4A	L4150d				119
120		L4138D	TK4110			120
121						121
122						122
123	APP4B					123
124						124
125	APP4Bs	AL3				125
126		AL4				126
127	APP4C					127

	American Type	Brimar Micromesh Standard	Clarion	Cossor	Dario	
128				420TDD		128
129						129
130					TBL44	130
131						131
132					TL54	132
133						133
134						134
135		PenA1		425PT	TE434	135
136				PT41	TC434	136
137				415PT		137
138				410PT		138
139						139
140						140
141						141
142						142
143						143
144			ACP	4XP	TD044	144
145					TD24	145
146						146
147						147
148						148
149		1A7	UF41	431U		149
150		R1			TZ34	150
151		R2				151
152						152
153			UF4	442BU	FW1	153
154				506BU	FW2	154
155				408BU		155
156						156
157						157
158		R3			FW3	158
159				460BU		159
160						160
161						161
162					TF104	162
163						163
164						164
165				PT41B		165
166						166
167						167
168		R3		441U	T234, 1FW1	168
169						169
170				412SU	SW1	170
171		1A7, R2		441U	1FW4	171
172				41MDG		172
173						173
174						174
175	955					175
176	954					176
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	Ekco	E.T.A.	Ever-Ready	Ferranti	Fotos	
128				PT4D		128
129						129
130	DO42		A27D			130
131						131
132	OP41		A70E			132
133						133
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136					G100	136
137					D100	137
138					F100	138
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142						142
143						143
144			S3CC	LP4	F5	144
145				P4	P10, FN5	145
146						146
147						147
148						148
149			A11B			149
150			A11D			150
151			A11A			151
152						152
153			S11A	R4	V6, V6N	153
154			S11D			154
155						155
156						156
157						157
158	R41	D3-80B		R4A		158
159		D5-125B			W10, V22	159
160						160
161						161
162						162
163						163
164						164
165						165
166						166
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168			A11C			168
169			A11B			169
170						170
171			A11B			171
172					TM4	172
173						173
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177					BFI.411	177
178						178
179					D40	179
180					C150	180
181					D60	181
182					D70	182
183						183
184					P13	184
185					T4400	185
186						186
187					T4000	187
188						188
189					S100	189
190						190
191					MX80	191

	Graham Farrish (Ring)	Hivac	Lissen	Marconi Osram	Mazda	
128		AC/ZDD		DN41	{AC2/PenDD AC5/PenDD	128
129						129
130						130
131						131
132		AC/YY				132
133						133
134				N43		134
135		FY		PT4	Pen425	135
136						136
137						137
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143						143
144		PX41		PX4	PP3/250	144
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147						147
148						148
149	{UU60/250	{UU60/250		MU12/14	{UU4, UU2	149
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152						152
153				{U10	UU120/350	153
154				{U12		154
155						155
156						156
157						157
158				U14	UU120/500	158
159						159
160				HA1	A40	160
161				ZA1	A41	161
162		PX5		PX25	PP5/400	162
163				PX25A		163
164				DA30	PA40	164
165				PT16		165
166				PT25H		166
167				PT25		167
168		UU120/350		{MU14	UU5	168
169		UU120/500		{M12/14		169
170						170
171		UU120/350		MU14	UU13	171
172					DW1/B	172
173				GU1		173
174				GU50		174
175				HA2		175
176				ZA2		176
177				P410		177
178						178
179						179
180				S410		180
181						181
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186						186
187						187
188						188
189				MPT4		189
190						190
191						191

	Miniwatt Dario	Mullard	Philips	Pix	Record	
128						128
129						129
130		Pen4DD				130
131	ABL1		ABL1			131
132		PenB4				132
133		Pen428				133
134						134
135	E443H	PM24M	E443H		PT24M	135
136	E443N	PM24	E443N			136
137	B443	PM24A	B443			137
138	C443		C443			138
139						139
140						140
141						141
142						142
143	AL1		AL1			143
144	E406N	AC044	E406N			144
145	D404	AC064	D404		ACPX4	145
146						146
147						147
148			AD1			148
149		1W2	1881	120/350	FW4A	149
150		1W3	1867			150
151		1W4/350	1881A			151
152		AZ3				152
153	506	DW2	506		FW350	153
154	1805	DW3	1805			154
155		DW4/350	1807			155
156			1821			156
157	AZ1	AZ1	AZ1			157
158		DW4	1561	120/500	FW3	158
159		DW4/500			FW5	159
160		AT4				160
161		AP4				161
162	F410	DO24	F410			162
163		DO26				163
164		DO30				164
165		PM24B				165
166		PM24D				166
167	F443N	PM24E	F443N			167
168		1W4/500	1867			168
169			1861			169
170	505	DU4	505			170
171		1W4			1FW A	171
172	E441	AC/DG	E441			172
173		RG1/250				173
174		RG1/240				174
175						175
176						176
177	B406	PM4X	B406			177
178	424	PM3D	B424			178
179	B438	PM3DX	B438			179
180	B442	PM13X	B442			180
181	B443S	PM24X	B443S			181
182	C443N	PM24DC	C443N			182
183	C443Na	PM24AC	C443Na			183
184	E408N	AC084	E408N			184
185	E444	SD4	E444			185
186	E444S	TD4	E444S			186
187	E448	DH4	E448			187
188	E449	VH4	E449			188
189	E453	Pen4VX	E453			189
190	R80					190
191	TA31					191

	Six-Sixty	Telefunken	362	Triotron	Obsolete etc., Tungsram	
128						128
129						129
130				DP495		130
131		ABL1			TABL1	131
132					APP4D	132
133						133
134						134
135	SS4PenM	RES964	ACME4B	P435	PP4101	135
136	SS4PenSP	RES364d		P425	PP4100	136
137	SS415PP	RES174d			PP480	137
138		RES364			PP415	138
139		RES664			PP416	139
140					PP430	140
141					PP431	141
142					PP495	142
143		AL1			TAL1	143
144	SSHV4/1		ACPX4A	K435/10	P430	144
145	SSHV4/2	RE604			P460	145
146					P495	146
147						147
148					TAD1	148
149	SS1H120/350				APV4200	149
150	SS1H60/250					150
151						151
152						152
153	SSW120/350	RGN1054	RB250/80	G470	PV495	153
154		RGN1064		GN24	PV4100	154
155				GA24	PV475	155
156				G460	PV4	156
157		AZ1			PV4s	157
158	SSW120/500		RB500/120	G4120	PV4200	158
159		RGN2004		G4120N		159
160						160
161						161
162				K480		162
163						163
164						164
165						165
166						166
167				P460	PP4100	167
168	1H120-350		RB42	G4120N	APV4	168
169						169
170	SS462	RGN1304		G450	V495	170
171				G4120N	APV4	171
172		REN704			DG4100	172
173						173
174						174
175						175
176						176
177		RE114				177
178		RE084				178
179						179
180		RES094				180
181		RES164d				181
182		RES374d				182
183		RES374				183
184						184
185		RENS1254		B430N		185
186		REN924		B435N		186
187		RENS1224				187
188		RENS1234				188
189		RENS1374d		P440N		189
190						190
191		RE074d			DG407/0	191

	Tungsram	Valvo	Visseaux			
128	DDPP4B					128
129						129
130	DDPP4M					130
131	DDPP4Bs	ABL1				131
132	APP4E					132
133						133
134	APP4G*					134
135	PP4	L496D	RS4543			135
136		L491D				136
137		L415D	RO4243			137
138		L425D	RO4343			138
139						139
140						140
141						141
142						142
143	PP4s	AL1				143
144		L410	RO4104			144
145	P12/250	LK460	RO4404			145
146						146
147	P15/250					147
148	P15/250s					148
149	APV4					149
150						150
151						151
152	IRV120/350s					152
153	RV120/350	G490	V2			153
154		G1064				154
155						155
156						156
157	RV120/350s	AZ1				157
158	RV120/500					158
159		G4200	V480			159
160						160
161						161
162	P27/500	LK4200	RO4810			162
163						163
164						164
165						165
166						166
167		L495D				167
168						168
169						169
170		G495	V1			170
171						171
172			RS4141			172
173						173
174						174
175						175
176						176
177	P410	L410	RO4206			177
178	LD410	A411	RO4324			178
179	HR410	W411				179
180	S410	H410D	RO4142			180
181	PP416	L416D				181
182		L427D				182
183	PP431					183
184	P4100	LK4110				184
185	DS4100	AN4126	RS4144			185
186		AN4092				186
187	MH4100	X4122				187
188	FH4105	X4123				188
189	APP4120	L4150D	RS4353			189
190			RO4410			190
191		U408D	RO4141			191

	American Type	Brimar Micromesh Standard	Clarion	Cossor	Dario	
192						192
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224				4/100BU		224
225				451U		225
226						226
227						227
228				41ME	TM14	228
229						229
230						230
231		20A1			TCH24	231
232				4THA		232
233						233
234				41STH		234
235		15A2		41MPG	TK24	235
236						236
237		15A2		41MPG		237
238						238
239						239
240		9A1		MVSPen	TE474	240
241		9A3				241
242				202STH		242
243						243
244				302THA		244
245		15D1	FC13	13PGA	TB5013	245
246						246
247					TF313	247
248		9D2		13VPA		248
249						249
250				13VPA	TF313M	250
251						251
252						252
253		8D2		13SPA	TF713	253
254						254
255						255

	Ekco	E.T.A.	Ever-Ready	Ferranti	Fotos	
192					V21B	192
193					V21M	193
194						194
195					V23	195
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197						197
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204						204
205					S4150C	205
206					C9	206
207					B9	207
208						208
209					D15	209
210					C25	210
211					MX80	211
212						212
213					D9	213
214					F10	214
215					S415N	215
216						216
217					TM4	217
218						218
219						219
220					V22	220
221					D5	221
222						222
223						223
224						224
225					W10	225
226						226
227						227
228			A39A			228
229						229
230						230
231			A36B			231
232			A36C			232
233						233
234			A36A			234
235			A80A			235
236						236
237				VHT4		237
238						238
239						239
240			A50M	VPT4A	T4700	240
241						241
242			C36A			242
243			C36C			243
244			C36B			244
245			C80B	VHTA		245
246						246
247				VPTA		247
248						248
249						249
250	VPU1		C50N			250
251						251
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253						253
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	Graham Farrish (Ring)	Hivac	Lissen	Marconi Osram	Mazda	
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193						193
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222						222
223						223
224				U18/20		224
225						225
226						226
227					AC/ME	227
228						228
229						229
230						230
231				X41	AC/TH1	231
232						232
233		AC/TP			AC/TP	233
234				X41		234
235				MX40		235
236						236
237				MX40		237
238				X42		238
239						239
240		AC/VP		VMP4G	AC/VP1	240
241						241
242						242
243					TH2320	243
244					TH2620	244
245						245
246						246
247					VP1320	247
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250					VP1322	250
251						251
252						252
253					SP1320	253
254						254
255						255

	Miniwatt Dario	Mullard	Philips	Pix	Record	
192	1801	DW1	1801			192
193	1802	DU1	1802			193
194	1817		1817			194
195	1832		1832			195
196						196
197	AL5		AL5			197
198						198
199	AD1		AD1			199
200			D404			200
201			F410			201
202	1803		1803			202
203	F443		F443			203
204	F443N	PM24D	F443N			204
205	E445	YM4V	E445			205
206	A409	PM3X	A409			206
207	A410N	MA410	A410N			207
208	A414K	PM4DS	A414K			208
209	A415	PM4DX	A415			209
210	A425	PM3AX	A425			210
211	A441N	PM4DG	A441N			211
212	B403		B403			212
213	B409	PM4	B409			213
214	D410	AC064X	D410			214
215	E415	164V	E415			215
216	E425		E425			216
217	E441	AC/DG	E441			217
218	E444S	TD4	E444S			218
219	373		373			219
220	1561	DW3	1561			220
221	B405	PM254X	B405			221
222						222
223	AZ2	AZ2	AZ2			223
224	1560	FW4/500	1560			224
225	1815		1815			225
226	1831		1831			226
227						227
228		TV4				228
229		TV4A				229
230						230
231		TH4A			AC/TH4	231
232		TH4B				232
233		TP4				233
234		TH4				234
235	AK1	FC4	AK1		AC/DC4	235
236	AK2		AK2			236
237						237
238						238
239	AK1		AK1			239
240	E447		E447		ACVHFP	240
241						241
242		TH21C				242
243		TH22C				243
244		TH30C				244
245		FC13C			OC13	245
246	CK1	FC13	CK1		OC13L	246
247						247
248						248
249	CF3		CF3		VHFP13L	249
250		VP13C			VHFP13	250
251						251
252	CF2	VP13A	CF2			252
253		SP13A				253
254	CF1	SP13	CF1		HFP13L	254
255	CF7		CF7			255

	Six-Sixty	Telefunken	362	Triotron	Obsolete etc., Tungsram	
192		RGN504		G431		192
193		RGN354		G429		193
194		RGN4004				194
195		RGN1404		G4100		195
196		RENS1294				196
197		AL5				197
198		REO34				198
199		AD1				199
200		RE604				200
201						201
202		RGN564		G430		202
203				P440		203
204				P460		204
205		REN1214		S415N		205
206		REO74				206
207		RE064				207
208						208
209		RE084				209
210		RE034				210
211		RE074d				211
212						212
213		RE134				213
214						214
215		REN804				215
216						216
217		REN704				217
218		REN924				218
219						219
220		RGN2004				220
221		RE124				221
222						222
223		RGN2004				223
224					PV4201	224
225		RGN2504	RB650/250			225
226						226
227						227
228					ME4	228
229						229
230						230
231					TX4B	231
232						232
233						233
234				TH401		234
235		AK1		O406	MO465	235
236		AK2			TAK2	236
237						237
238						238
239		AK1				239
240	SSHP2AC	RENS1294		S434N	HP4106	240
241					HP4105	241
242						242
243						243
244						244
245				O1307		245
246		CK1		O1307	TCK1	246
247				S1323		247
248						248
249		CF3		S1323	TCF3	249
250						250
251						251
252		CF2			TCF10	252
253				S1324		253
254		CF1		S1328	TCF7	254
255		CF7				255

	Tungsram	Valvo	Visseaux			
192	PV430	G430	V250			192
193	V430	G415	V150			193
194		G4400				194
195	V4200	G4205				195
196	HP4106/51					196
197	APP4Es	AL5				197
198	HR406					198
199	P15/250s	AD1				199
200	P12/250	LK460				200
201	O15/400	LK4200, LK4110				201
202	V460	G465				202
203		L495D				203
204		L497D				204
205	AS4105	H4125D	RS4145			205
206	G407	H406	RO4109			206
207	G405		RO410			207
208	G410					208
209	LD410	A408	RO4215			209
210	HR406	W406	RO4125			210
211	DG407	U409d	RO4181			211
212	P415					212
213	L414	L413	RO4309			213
214	P455		RO4610			214
215	AG4100	H4100	RS4215			215
216	P430					216
217	DG4100	U4100d	RS4141			217
218	DS4101	AN4092				218
219	PV480					219
220	PV4200	G4200	V480			220
221	P414	L414	RO4305			221
222						222
223	RV120/500s	G2004				223
224						224
225	RV200/600	G4250				225
226						226
227	VME4					227
228	ME4s					228
229						229
230	DDPP6B					230
231	TH4A					231
232	TH4B					232
233	TP4					233
234	TX4					234
235	VO4	AK1				235
236	VO4s	AK2				236
237	MH4105/71					237
238						238
239	MH4105/73	AK1				239
240	HP4106c	H4129D	RS4347			240
241						241
242	TX21					242
243	TH29					243
244	TH30					244
245	VO13					245
246	VO13s	CK1				246
247	VP13					247
248	VP13K					248
249	VP13s	CF3				249
250	VP13B					250
251	HP13					251
252	HP13s	CF2				252
253	SP13					253
254	SP13s	CF1				254
255		CF7				255

	American Type	Brimar Micromesh Standard	Clarion	Cossor	Dario	
256				13SPA	TF713M	256
257		4D1	HF13			257
258						258
259		10D1	DD13			259
260						260
261						261
262		11D3	DDT13	13DHA	TBC113	262
263		11D5		202DDT		263
264						264
265						265
266						266
267						267
268						268
269						269
270					TB4320	270
271				402Pen		271
272				4020T		272
273						273
274		7D6			TL413	274
275						275
276						276
277						277
278						278
279						279
280						280
281					TW1	281
282					TW1P	282
283						283
284						284
285						285
286		1D5		40SUA		286
287						287
288					TW2P	288
289						289
290						290
291			ADVHP		TB4720	291
292						292
293						293
294			ADHP		TB4620	294
295						295
296						296
297						297
298						298
299			ADHF			299
300					TB9920	300
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302			ADL			302
303			ADPN			303
304					TBL226	304
305						305
306			UDH			306
307					TBY233	307
308						308
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316						316
317						317
318						318
319						319

	Ekco	E.T.A.	Ever-Ready	Ferranti	Fotos	
256			C50B			256
257			C30B	DA		257
258						258
259			C20C			259
260						260
261				ZD		261
262	DTU1		C23B	HAD		262
263						263
264						264
265						265
266				PTA		266
267						267
268						268
269						269
270						270
271				PTZ		271
272						272
273						273
274			C70D	PTZ		274
275						275
276						276
277						277
278						278
279						279
280						280
281			C10B	RZ		281
282						282
283						283
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312						312
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314					W20	314
315						315
316						316
317						317
318						318
319						319

	Graham Farrish (Ring)	Hivac	Lissen	Marconi Osram	Mazda	
256						256
257					HL1320	257
258						258
259					DD620	259
260						260
261					DD620	261
262					HLDD1320	262
263						263
264						264
265						265
266		Y13		N30		266
267				N30G		267
268				KT30		268
269						269
270						270
271						271
272						272
273						273
274					Pen3520	274
275						275
276						276
277						277
278						278
279					PenDD4020	279
280						280
281					U4020	281
282						282
283		U26		U30		283
284						284
285						285
286					U4020	286
287						287
288						288
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317						317
318						318
319						319

	Miniwatt Dario	Mullard	Philips	Pix	Record	
256		SP13C			HFP13	256
257		HL13C				257
258	CC2	HL13	CC2			258
259		2D13C				259
260	CB2	2D13A	CB2			260
261						261
262		TDD13C			DDTR13	262
263						263
264	CBC1	TDD13	CBC1			264
265			CL1			265
266						266
267						267
268						268
269						269
270	CL2	Pen26	CL2		PT24DAL	270
271						271
272						272
273	CL4		CL4			273
274		Pen36C				274
275						275
276						276
277	CL6	CL6	CL6			277
278	CBL1	CBL1	CBL1			278
279						279
280		Pen40DD				280
281	CY1	UR1C	CY1C			281
282		UR1	CY1		HW20L	282
283						283
284						284
285	CY2	UR2	CY2			285
286					HW20	286
287		UR3C				287
288	CY3	UR3	CY3		UFW30L	288
289		TV6				289
290						290
291		VP20	B2047			291
292	B2045	MM20	B2045			292
293		VM20				293
294	B2046	SP20	B2046			294
295						295
296						296
297	B2052T	SG20A	B2052T			297
298		SG20				298
299	B2038	H20	B2038			299
300	B2099	HL20	B2099			300
301						301
302						302
303	B2043	Pen20	B2043			303
304						304
305						305
306						306
307						307
308	B543		B543			308
309	B2041	DG20	B2041			309
310	B2044	SD20	B2044			310
311	E707		E707			311
312	F215		F215			312
313	F704		F704			313
314	1562	DU15	1562			314
315						315
316						316
317			1882			317
318						318
319			E707			319

	Six-Sixty	Telefunken	362	Triotron	Obsolete etc., Tungsram	
256						256
257						257
258		CC2			TCC2	258
259				D1300		259
260		CB2		D1300	TCB2	260
261						261
262				DDT1336		262
263						263
264		CBC1		DDT1336	TCBC1	264
265					TCL1	265
266						266
267						267
268						268
269				P2060		269
270		CL2		P2060	TCL2	270
271						271
272						272
273		CL4			TCL4	273
274						274
275						275
276						276
277		CL6			(PP37s)	277
278		CBL1			DDPP39S	278
279						279
280				DP4480		280
281		CY1		G2080		281
282				G2080		282
283						283
284				G3060		284
285		CY2		G3060		285
286						286
287						287
288		CY3				288
289					ME6	289
290						290
291		RENS1894		S2034N	SE2118	291
292		RENS1819		S2012N	SE2018	292
293						293
294		RENS1884	MHM20	S2035N		294
295						295
296						296
297		RENS1818	MSG20	S2030N		297
298		RENS1820		S2010N		298
299		REN1821	MHL20	A2040N	G2018	299
300		REN1814		A2030N		300
301		REN1822	MXP20	E2020N		301
302						302
303		RENS1823d	MME20	P2020N	PP2018D	303
304				P2460	(PP4018)	304
305						305
306				G3070	V2018	306
307				G3412	PV4018	307
308		RES105				308
309		RENS1817D		D2010N	DG2018	309
310		RENS1854		B2030N		310
311		RV258				311
312						312
313						313
314						314
315		BB1				315
316		TACH1				316
317						317
318		RV239				318
319		RV258				319

	Tungsram	Valvo	Visseaux			
256	SP13B					256
257	HL13					257
258	HL13s	CC2				258
259	DD13					259
260	DD13s	CB2				260
261	DD6					261
262	DDT13					262
263						263
264	DDT13s	CBC1				264
265	PP13s					265
266	PP13A					266
267						267
268						268
269	PP24					269
270	PP24s	CL2				270
271	PP34					271
272						272
273	PP34s	CL4				273
274	PP35					274
275	PP36					275
276	PP37					276
277	CL6	CL6				277
278	CBL1	CBL1				278
279	DDPP39					279
280	DDPP39M					280
281	V20	CY1				281
282	V20s					282
283	PV25					283
284	PV29					284
285	PV29s	CY2				285
286	V30					286
287	PV30					287
288	PV30s	CY3				288
289	ME6s					289
290	MH1118					290
291	HP2118	H2618D				291
292		H1918D				292
293						293
294	HP2018	H2518D				294
295	HP1118					295
296	HP1018					296
297	SS2018	H1818D				297
298	S2018	H2018d				298
299	R2018	A2118				299
300		W2418				300
301	P2018	L2218				301
302						302
303	PP2018	L2318D				303
304	PP4118					304
305	DD818					305
306	V2118					306
307	PV3018					307
308	PP610	L510D				308
309	PG2018	U1718D				309
310	DS2018	AN2127				310
311						311
312		A2200W				312
313						313
314		G715	V781			314
315	DD818	BB1				315
316	TX4/73	TACH1				317
317	80	GX5200				316
318	P40/800	LK7115				318
319	P41/800	LK7110				319

	American Type	Brimar Micromesh Standard	Clarion	Cossor	Dario	
320						320
321						321
322						322
323	25A6G					323
324				620T		324
325	35Z4					325
326	50L6					326
327	6D8					327
328	6S7G					328
329	6L6G					329
330	6F6G					330
331				202VP		331
332	6K8G					332
333	6A8G	7D3		40PPA		333
334	6L7G					334
335	6J7G					335
336						336
337	6W7G					337
338	6K7G					338
339	6U7G					339
340	6H6G					340
341	6F5G					341
342	6J5G					342
343	6C5G					343
344	6Q7G					344
345	6T7G					345
346	6R7G					346
347	6AG6G					347
348	6F6G					348
349	6L6G					349
350	25L6G					350
351	6N7G					351
352	5Y3G					352
353	5Z4G					353
354	5U4G					354
355	6J8G					355
356	1A7G					356
357	1N5G					357
358	1H5G					358
359	1C5G					359
360				DVSG		360
361				DHL		361
362				DDT16		362
363				DP/Pen		363
364						364
365						365
366						366
367						367
368						368
369						369
370		2101		2101		370
371		2102		2102		371
372		2103		2103		372
373	3Q5G					373
374		7D8				374
375	25Z4G					375
376	6G5G					376
377	6U5G					377
378						378
379						379

	Ekco	E.T.A.	Ever-Ready	Ferranti	Fotos	
320						320
321						321
322						322
323						323
324						324
325						325
326						326
327						327
328						328
329						329
330						330
331				VPTA(13v)		331
332						332
333						333
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361						361
362						362
363						363
364				VHTS		364
365				VPTSB		365
366				VPTS		366
367				DS		367
368				HSD		368
369				PTSA		369
370						370
371						371
372						372
373						373
374				PTA		374
375						375
376						376
377						377
378						378
379						379

	Graham Farrish (Ring)	Hivac	Lissen	Marconi Osram	Mazda	
320						320
321						321
322						322
323				KT33		323
324				LS6A		324
325				U71		325
326				KT72		326
327				X73M		327
328				KTW61		328
329				N66		329
330				N63		330
331					VP1321	331
332				X61		332
333				X63		333
334				X64		334
335				KTZ63		335
336				Z63		336
337				KTZ73		337
338				KTW63		338
339				W63		339
340				D63		340
341				H63		341
342				L63		342
343						343
344				DH63		344
345				DH73		345
346				DL63		346
347				KT61		347
348				KT63		348
349		AC/Qa		KT66		349
350				KT32		350
351				B63		351
352				U50		352
353						353
354				U52		354
355				X65		355
356				X14		356
357				Z14		357
358				HD14		358
359				N14		359
360				VDS		360
361				DH		361
362				DHD		362
363				DPT		363
364				X30		364
365				W31		365
366						366
367				H30		367
368				DH30		368
369				KT31		369
370						370
371						371
372						372
373				N15		373
374					PEN1340	374
375				U31		375
376				Y63		376
377				Y64		377
378				DA60	BS60	378
379				DA100	BS100	379

	Miniwatt Dario	Mullard	Philips	Pix	Record	
320	B2044S		B2044S			320
321	B2048		B2048			321
322	B2049		B2049			322
323						323
324		D025				324
325						325
326						326
327						327
328						328
329		EL36	EL36			329
330		EL33	EL33			330
331						331
332		ECH33	ECH33			332
333						333
334						334
335						335
336						336
337						337
338		EF39	EF39			338
339						339
340						340
341						341
342						342
343						343
344		EBC33	EBC33			344
345						345
346						346
347		EL33				347
348		EL33				348
349		EL35				349
350						350
351						351
352						352
353						353
354						354
355						355
356		DK32				356
357		DF33				357
358		DAC32				358
359		DL35				359
360						360
361						361
362						362
363						363
364						364
365						365
366						366
367						367
368						368
369						369
370						370
371						371
372						372
373		DL33				373
374		PEN13C				374
375						375
376						376
377						377
378		D060				378
379		MZ1/100				379

	Six-Sixty	Telefunken	362	Triotron	Obsolete etc., Tungsram	
320		REN1826		B2035N		320
321		RENS1824		H2025N		321
322		RENS1834		H2026N		322
323						323
324						324
325						325
326						326
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375						375
376						376
377						377
378						378
379						379

	Tungsram	Valvo	Visseaux			
320		AN2718				320
321	MH2018	X2818				321
322	FH2118	X2918				322
323						323
324						324
325						325
326						326
327						327
328						328
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377						377
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379						379

AMERICAN TYPE VALVE SUBSTITUTION CHART

Before any valve substitution is attempted, the careful reading of the following explanatory information on the subject is essential.

The substitutions shown in this chart are successful in practically all cases. There conceivably could be a few instances where circuit sensitivity to slight differences in valve characteristics might prevent wholly satisfactory operation, or where the substitute valve type may have shorter life than the original even though operation is satisfactory. It is impossible, however, to cover all the exceptions because of the many deviations in circuit design.

Cross reference in the chart will be found quite complete but not always reversible. For example, detector diodes such as type 6H6GT should not be substituted for power diodes such as 6X5GT since the substitute would be extremely short-lived in this application.

In most cases types of the 6-volt series have identical counterparts in the 12-volt series, the only difference being in heater voltage. As examples: except for heater ratings a 6SK7GT is the same as a 12SK7GT; and a 7A7 is the same as a 14A7. Rare exceptions to this rule to be noted are:—

a 6B8 **is** similar to a 12C8, **not** a 12B8;

a 6A7 **is not** similar to a 12A7.

✣ ✣ ✣

Where series connection of heaters is used, care must be taken to ensure the correct amount of current through each heater when the substitute has a different heater current than the original. If the current is too high, valve life will be shortened. If the current is too low, operation may not be satisfactory. Compensating resistors therefore must be added to adjust the current. The following two examples will assist in calculating these resistors:—

1. To replace a 150-milliampere valve, such as a 7B7, with a 300-milliampere valve, such as a 7A7: The series heaters of the original valves of the receiver have a normal current of 150 milliamperes. Since the substitute type operates at 300 milliamperes, shunt resistors must be connected across each of the other valves. The value of each resistor must be equal to the heater resistance of the valve to which it is connected, i.e., the heater resistance of any valve $= \frac{\text{Heater Voltage}}{\text{Heater Current}}$

No resistor should be connected across the substitute valve. In addition, a ballast valve or resistor cord, when used in the receiver, must be replaced by a unit having half the resistance of the original.

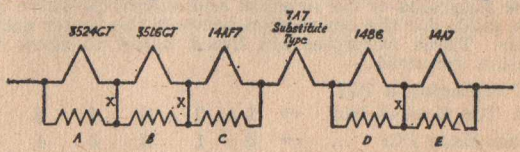


Figure (a)

Leads marked X in Figure (a) may be eliminated if care is observed that these are the only leads eliminated. This means that resistors A, B and C can be replaced with a single resistor equal to the sum of A, B and C. The same is true of resistors D and E.

✣ ✣ ✣

2. To replace a 300-milliampere valve, such as a 7A7, with a 150-milliampere valve, such as a 7B7: The series heaters of the original valves in the set have a current of 300 milliamperes. Since the substitute valve operates at 150 milliamperes, a shunt resistor equal in value to the resistance of the valve must be connected across it. The heater resistance of the 7B7 valve is equal to $\frac{\text{Heater Voltage}}{\text{Heater Current}} = \frac{6.3}{0.15} = 42$ ohms. See Figure (b).

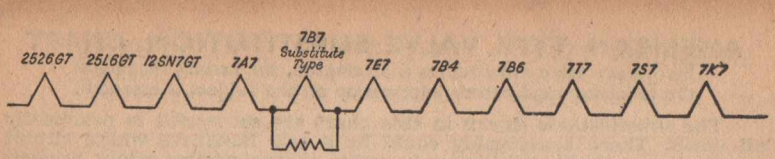


Figure (b)

The parallel combination will then pass twice the current of the valve, so that 150 milliamperes flow through the valve and 150 milliamperes through the 42-ohm shunting resistor. The current, flowing through the other valves, will then be the same as in the original circuit.

✣ ✣ ✣

There are a number of cases where remote cut-off and sharp cut-off valves may be interchanged. In some cases this may cause slight differences in the operation of the automatic volume control of the receiver. Metal, "G," "GT" and "GT/G" types are all directly interchangeable, although occasionally a valve shield may be necessary to prevent oscillation. Space limitations may prevent the use of the "G" types in certain installations.

✣ ✣ ✣

An adapter is strongly recommended in place of changing or reconnecting the socket. The use of the adapter permits the installation of the original valve type at a later date and avoids confusion in the use of published circuits for subsequent servicing. However, there will be some cases where necessary room for an adapter is not available, thereby requiring a change of the socket.

Many commercial adapters for substitute types are readily available, but an adapter can be easily assembled by the serviceman to meet his own requirements. The following suggestions on adapter construction may be helpful:—

The use of a bakelite socket which fits snugly inside the top rim of the base makes a neater and more rugged wiring job. Number 20 tinned wire is ideal for connecting the top socket to the adapter base. Cut the leads about an inch longer than necessary, insulate with spaghetti to prevent short circuits, and pull leads taut when assembled. Cut leads flush with the end of the base pin, apply soldering flux and, holding the adapter upright, dip end of pin in a puddle of solder. A small hole drilled in the soldering iron tip will serve as a solder cup. Solder will flow up the pin, making a smooth, finished end. Where a top cap lead must be added, it should be shielded to avoid pick-up troubles.

The base diagrams of the original and substitute valve types should be used as a guide for the connection between the upper socket and the base adapter. Three examples are listed below to show the type of interconnection required:—

(1) 6SA7GT replacing a 7Q7

Connect Top Socket Pin →	1	2	3	4	5	6	7	8
to Bottom Base Pin ... →	5	1	2	3	4	7	8	6

↑ Connect 5 and 7 together ↑

(2) 6SQ7GT replacing a 75

Connect Top Socket Pin →	1	2	3	4	5	6	7	8
	No	Top						
to Bottom Base Pin →	Connection	Cap	5	4	3	2	6	1

(3) 75 replacing 6SQ7GT

							Top
Connect Top Socket Pin →	1	2	3	4	5	6	Cap
to Bottom Base Pin ... →	8	6	5	4	3	7	2

The continued operation of many receivers requiring valve types no longer readily available can be accomplished by the careful use of this valve substitution chart.

AMERICAN TYPE VALVE SUBSTITUTION CHART

It will be noted that in this list there are a number of American type valves which do not appear. This is due to the fact that reasonably simple substitution of these type numbers is impossible.

ORIGINAL	DIRECTLY INTERCHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
00A	01A, 40			
01A	00A, 40			
0A3	VR75/30			
0B3	VR90/30			
0C3	VR105/30			
0D3	VR150/30			
0Z4			6X5GT/G	7Y4, 84
0Z4A/1003			6X5GT/G	7Y4, 84
0Z4G			6X5GT/G	7Y4, 84
1A3		1R4/1294		
1A4	1B4	1D5G, 1E5G		
1A5GT/G	1Q5GT, 1T5GT, 1C5GT	1LA4, 1LB4, 3Q5GT		
1A6	1C6	1C7G, 1D7G		
1A7GT	1B7GT	1LA6, 1LC6		
1B4	1A4	1E5G, 1D5G		
1B5/25S		1H6G		
1B7GT	1A7GT	1LA6, 1LC6		
1C5GT	1Q5GT, 1T5GT, 1A5GT	1LB4, 3Q5GT, 1LA4		
1C6	1A6	1C7G, 1D7G		
1C7G	1D7G	1A6, 1C6		
1D5G	1E5G	1A4, 1B4		
1D7G	1C7G	1A6, 1C6		
1E4G	1G4GT, 1H4G	1LE3, 30		
1E5G	1D5G	1B4, 1A4		
1E7G		2-type 1F5G		
1F4		1F5G		
1F5G		1F4		
1F6		1F7G		
1F7G		1F6		
1G4GT	1E4G, 1H4G	1LE3, 30		
1G5G	1J5G	950		
1H4G	1E4G, 1G4GT	1LE3, 30		
1H5GT/G		1LH4		
1H6G		1B5/25S		
1J5G	1G5G	950		
1J6G		19		

ORIGINAL	DIRECTLY INTERCHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
1LA4	1LB4	1A5GT		
1LA6	1LC6	1A7GT, 1B7GT		
1LB4	1LA4	1C5GT, 1Q5GT, 1T5GT, 3Q5GT, 1A5GT		
1LC5		1SA6GT		
1LC6	1LA6	1A7GT, 1B7GT		
1LD5		1SB6GT, 1S5		
1LE3		30, 1E4G, 1G4GT, 1H4G		
1LH4		1H5GT/G		
1LN5		1N5GT/G		
1N5GT/G		1LN5		
1Q5GT	1C5GT, 1T5GT, 1A5GT	1LB4, 3Q5GT, 1LA4		
1R4/1294		1A3		
1R5				
1S5		1SB6GT, 1LD5		
1SA6GT		1LC5		
1SB6GT		1LD5, 1S5		
1T5GT	1Q5GT, 1C5GT, 1A5GT	1LB4, 3Q5GT, 1LA4		
1V			1Z3	
2A3	45		6A3	6B4G, 6A5G
2A5			42, 41	6K6GT/G, 6Y6G, 6F6G, 7B5, 7C5
2A6			75	6SQ7GT, 6Q7GT, 6T7G, 6Q6G, 7K7, 7C6, 7B6, 6B6G
2A7			6A7	6A8GT, 6D8G, 7A8, 6J8G, 7S7, 7B8, 7J7
2B7			6B7	6B8GT, 7E7
2E5			6E5	
3B5GT		3S4		
3B7/1291		3A5		
3C5GT		3LE4,		
3D6/1299	3LF4	3Q5GT, 3Q4		
3LE4		3C5GT		
3LF4	3D6/1299	3Q5GT, 3Q4		
3Q4		3Q5GT, 3LF4, 3D6/1299		
3Q5GT/G		3Q4, 3LF4, 3D6/1299		
5T4	5U4G	5Z3, 5X4G		
5U4G	5T4	5Z3, 5X4G		

ORIGINAL	DIRECTLY INTERCHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
5V4G	5Z4GT, 5W4GT 5Y3GT	83V, 5Y4G, 5X3, 80		
5W4GT/G	5Y3GT/G, 5V4G, 5Z4GT	80, 5Y4G, 5X3, 83V		
5X3	80, 83V	5Y3GT, 5W4GT, 5V4G, 5Y4G, 5Z4GT		
5X4G		5Z3, 5U4G, 5T4		
5Y3GT/G	5W4GT/G, 5V4G, 5Z4GT	80, 5Y4G, 5X3, 83V		
5Y4G		5X3, 5Y3GT, 80, 83V, 5W4G, 5V4G, 5Z4GT		
5Z3		5U4G, 5X4G, 5T4		
5Z4GT	5V4G, 5Y3GT, 5W4GT	83V, 5Y4G, 5X3, 80		
6A3		6B4G, 6A5G	45, 2A3	
6A4/LA	52			
6A5G	6B4G	6A3	45, 2A3	
6A6		6N7GT/G	53	
6A7		6A8GT, 6J8G, 6D8G, 7S7, 7J7, 7A8, 7B8	2A7	12A8GT, 14B7, 14J7, 14S7
6A8GT	6D8G	7A8, 7B8, 6A7	2A7, 12A8GT	14B8, 14J7, 14S7
6AB5-6N5	6E5		2E5	
6AB6G	6N6G	6B5		
6AB7/1853		7V7, 7W7		14W7
6AD5G		6SF5GT, 6K5GT, 6F5GT, 7B4		12SF5GT, 12F5GT
6AF5G	6P5GT			27
6AG5	6AK5	717A		
6AH5G		6L6G, 6AL6G		
6AH7GT		6SN7GT, 7N7, 6F8G	12AH7GT	14N7 14AF7, 12SN7GT
6AK5	6AG5	717A		
6AK6		6G6G		
6AL6G		6L6G, 6AH5G		
6B4G	6A5G	6A3		45, 2A3
6B5		6N6G, 6AB6G		
6B6G	6T7G-6Q7G, 6Q7GT	6SQ7GT, 7B6, 7C6, 75, 7K7		2A6, 14B6, 12SQ7GT, 12Q7GT
6B7		6B8GT, 7E7	2B7	12SF7, 12C8, 14E7
6B8GT		6B7, 7E7		2B7, 12SF7, 12C8, 14E7
6C4		6J5GT, 7A4, 6C5G, 6L5G		14A4, 12J5GT
6C5GT/G	6J5GT/G, 6L5G	7A4, 6C4		14A4, 12J5GT
6C6	77, 6D6 78	6J7GT, 6SJ7GT, 7C7, 6W7G, 6K7GT, 6SK7GT, 7B7, 6SS7, 6U7G, 7A7, 6S7G	57, 58	12J7GT, 12SJ7GT, 12SK7GT, 12K7GT, 14A7/12B7, 14C7

ORIGINAL	DIRECTLY INTERCHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
6C8G		6SL7GT, 7F7, 6SC7GT		
6D6	78, 77, 6C6	6J7GT, 6SJ7GT, 7C7, 6W7G, 6K7GT, 6SK7GT, 7B7, 6SS7, 6U7G, 7A7, 6S7G	57, 58	12J7GT, 12SJ7GT, 12SK7GT, 12K7GT, 14A7/12B7, 14C7
6D8G	6A8GT, 6J8G	6A7, 7A8, 7B8, 7J7, 7S7	2A7	
6E5	6AB5-6N5		2E5	
6F5GT		6K5G, 6SF5GT, 7B4, 6AD5G		
6F6GT/G	6K6GT/G, 6V6GT/G	42, 41, 7C5, 7B5	2A5	14C5
6F7		6P7G		
6F8G		6SN7GT, 7N7, 6AH7GT		14N7, 12SN7GT
6G6G		6AK6		
6H6GT/G	6X5GT/G, 6ZY5G	7A6, 7Y4, 7Z4, 84	12H6	14Y4
6J5GT/G	6C5GT, 6L5G	6C4, 7A4	12J5GT	14A4
6J7GT	6W7G, 6S7G, 6U7G	6SJ7GT, 77, 7A7, 7B7, 7C7, 6C6, 6D6, 78, 6SK7GT, 6SS7	12J7GT, 12K7GT	12SJ7GT, 12SK7GT, 14C7, 58, 57, 14A7/12B7
6J8G	6A8GT, 6D8G	7J7, 7A8, 7B8, 7S7, 6A7	12A8GT	2A7, 14B8, 14J7, 14S7
6K5GT		7B4, 6AD5G, 6F5GT, 6SF5GT		12SF5GT, 12F5GT
6K6GT/G	6F6GT/G, 6V6GT/G	41, 42, 7B5, 7C5	2A5	14C5
6K7GT	6S7G, 6U7G, 6W7G	7A7, 7B7, 6SK7GT, 6D6, 78, 6SS7, 6C6, 6SJ7GT, 77	12J7GT, 12K7GT	12SK7GT, 12SJ7GT, 14A7/12B7, 14C7, 58, 57
6K8GT			12K8GT	
6L5G	6J5GT/G, 6C5GT	6C4, 7A4		14A4, 12J5GT
6L6G		6AH5G, 6AL6G		
6N6G	6AB6G	6B5	25N6G	25B5
6N7GT/G		6A6		53
6P5GT	6AF5G	76		
6Q7GT	6T7G/6Q6G	6SQ7GT, 7B6, 7C6, 75	12Q7GT	12SQ7GT, 2A6, 14B6
6R7GT		6SR7GT, 6ST7, 7E6		12SR7GT, 14E6
6S7G	6K7GT, 6U7G, 6W7G	7A7, 7B7, 6SK7GT, 6D6, 78, 6SS7, 77, 7C7, 6SJ7GT	12K7GT, 12J7GT	12SK7GT, 58, 57, 12SJ7GT, 14C7, 14A7/12B7
6SA7GT/G		7Q7	12SA7GT	14Q7
6SC7GT	6SL7GT	7F7, 6C8G	12SL7GT, 12SC7	14F7
6SD7GT	6SE7GT, 6SG7, 6SH7GT	7G7, 7H7, 7L7, 7T7	12SG7, 12SH7GT	14H7
6SE7GT	6SD7GT, 6SG7, 6SH7GT	7G7, 7H7, 7L7, 7T7	12SG7, 12SH7GT	14H7
6SF5GT		7B4, 6AD5G, 6F5GT, 6K5GT	12SF5GT	12F5GT
6SF7		7E7, 6B7, 6B8GT	12SF7	2B7, 14E7, 12C8

ORIGINAL	DIRECTLY INTERCHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
6SG7	6SH7GT, 6SD7GT, 6SE7GT	7G7, 7H7, 7L7, 7T7	12SG7, 12SH7GT	14H7
6SH7GT	6SG7, 6SD7GT, 6SE7GT	7G7, 7H7, 7L7, 7T7	12SG7, 12SH7GT	14H7
6SJ7GT/G	6SS7, 6SK7GT	6J7GT, 6W7G, 7C7, 6C6, 77, 6K7GT, 6U7G, 6S7G, 78, 7A7, 7B7, 6D6	12SJ7GT, 12SK7GT	12J7GT, 12K7GT, 14C7, 58, 57, 14A7/12B7
6SK7GT/G	6SS7, 6SJ7GT	6J7GT, 6W7G, 7C7, 6C6, 77, 6K7GT, 6U7G, 6S7G, 78, 7A7, 7B7, 6D6	12SK7GT, 12SJ7GT	12J7GT, 12K7GT, 14C7, 58, 57, 14A7/12B7
6SL7GT		7F7, 6C8G, 6SC7GT	12SL7GT, 12SC7	14F7
6SN7GT		6AH7GT, 6F8G, 7N7	12SN7GT	14N7, 14AF7, 12AH7GT
6SQ7GT/G		6T7, 6Q6G-6Q7GT, 7B6 6B6G, 75, 7K7, 7C6		2A6
6SR7GT	6ST7	6R7GT, 7E6	12SR7GT	14E6
6SS7	6SK7GT, 6SJ7GT	6K7GT, 6S7G, 6U7G, 6D6, 78, 7B7, 7A7, 6J7GT, 6W7G, 77, 7C7, 6C6	12SK7GT, 12SJ7GT	58, 12K7GT, 14C7, 14A7/12B7, 57, 12J7GT
6ST7	6SR7GT	6R7GT, 7E6	12SR7GT	14E6
6T7G-6Q6G	6B6G, 6Q7GT	6SQ7GT, 7B6, 7C6, 7K7, 75	12Q7GT	2A6, 14B6, 12SQ7GT
6U6GT	6W6GT, 6Y6G	7A5	12A6GT	14A5
6U7G	6K7GT, 6S7G, 6W7G, 6J7GT	6D6, 6SK7GT, 6SS7, 7A7, 78, 6C6, 6SJ7GT, 77, 7B7, 7C7	12K7GT, 12J7GT	14A7/12B7, 14C7, 12SK7GT, 12SJ7GT, 58, 57
6V6GT/G	6K6GT, 6F6GT	7C5, 41, 42, 7B5		2A5
6V7G		85		55
6W5G	6X5GT/G, 0Z4, 6ZY5G	7Y4, 7Z4, 84		14Y4
6W6GT	6U6GT, 6Y6G	7A5	12A6GT	14A5
6W7G	6J7GT, 6K7GT, 6S7G	77, 6C6, 7C7, 6SS7, 6SJ7GT, 7A7, 7B7, 6SK7GT, 6D6, 78	12J7GT 12K7GT	12SJ7GT, 12SK7GT, 14A7/12B7, 14C7, 58, 57
6X5GT/G	6W5G, 0Z4, 6ZY5G	84, 7Y4, 7Z4		
6Y6G	6U6GT, 6W6GT	7A5	12A6GT	14A5
6Y7G		79		
6ZY5G	6X5GT/G, 6W5G, 0Z4	7Y4, 7Z4, 84		14Y4
7A4		6J5GT, 6L5G, 6C4, 6C5GT	14A4	12J5GT
7A5		6U6GT, 6Y6G, 6W6GT	14A5	12A6GT
7A6	7Y4, 7Z4	6H6GT/G, 6X5GT/G, 6ZY5G, 84	14Y4	
7A7	7B7, 7C7	6SK7GT, 6SS7, 6D6, 6K7GT, 6S7G, 6U7G, 78, 77, 6C6, 6J7GT, 6SJ7GT, 6W7G	14A7/12B7, 14C7	12K7GT, 12SJ7GT, 12J7GT, 12SK7GT, 57, 58
7A8	7B8, 7S7, 7J7	6A7, 6A8GT, 6D8G, 6J8G	14B8, 14J7, 14S7	2A7, 12A8GT

ORIGINAL	DIRECTLY INTERCHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
7B4		6AD5G, 6SF5GT, 6F5GT, 6K5GT		12SF5GT, 12F5GT
7B5	7C5	6K6GT, 6F6GT, 41, 6V6GT, 42		2A5, 14C5
7B6	7C6	6SQ7GT, 6T7G-6Q6G, 6B6G, 6Q7GT, 7K7, 75	14B6	2A6, 12SQ7GT, 12Q7GT
7B7	7A7, 7C7	6SK7GT, 6SS7, 6D6, 6K7GT, 6S7G, 6U7G, 78, 77, 6C6, 6J7GT, 6SJ7GT, 6W7G	14A7/12B7, 14C7	58, 12K7GT, 12J7GT, 12SK7GT, 12SJ7GT, 57
7B8	7A8, 7S7, 7J7	6A7, 6A8GT, 6D8G, 6J8G	14B8, 14J7, 14S7	2A7, 12A8GT
7C5	7B5	6K6GT, 6V6GT, 41, 42, 6F6GT	14C5	2A5
7C6	7B6	6B6G, 6Q7GT, 6SQ7GT, 7K7, 6T7G-6Q6G, 75	14B6	2A6, 12SQ7GT, 12Q7GT
7C7	7A7, 7B7	77, 6C6, 6SJ7GT, 78, 6J7GT, 6W7G, 6SS7G, 6K7GT, 6SK7GT, 6S7G, 6U7G, 6D6	14A7/12B7, 14C7	12SJ7GT, 12SK7GT, 12K7GT, 12J7GT, 57, 58
7E6		6R7GT, 6ST7, 6SR7GT	14E6	12SR7GT
7E7		6B8GT, 6B7	14E7	2B7, 12C8, 12SF7
7F7		6C8G, 6SL7GT, 6SC7GT	14F7	12SL7GT, 12SC7
7G7/1232	7H7, 7L7, 7T7	6SG7, 6SH7GT, 6SD7GT, 6SE7GT	14H7	12SG7GT, 12SH7GT
7H7	7G7, 7L7, 7T7	6SG7, 6SH7GT, 6SD7GT, 6SE7GT	14H7	12SG7GT, 12SH7GT
7J7	7A8, 7B8, 7S7	6A7, 6A8GT, 6D8G, 6J8G	14J7, 14B8, 14S7	2A7, 12A8GT
7K7		7B6, 7C6, 6SQ7GT, 6B6G, 6T7G-6Q6G, 6Q7GT, 75	14B6	2A6, 12SQ7GT, 12Q7GT
7L7	7G7, 7H7, 7T7	6SG7, 6SH7GT, 6SD7GT, 6SE7GT	14H7	12SG7, 12SH7GT
7N7		6F8G, 6SN7GT, 6AH7GT,	14N7, 14AF7	12SN7GT, 12AH7GT
7Q7		6SA7GT/G	14Q7	12SA7GT
7R7			14R7	
7S7	7J7, 7A8, 7B8	6A7, 6A8GT, 6D8G, 6J8G	14S7, 14J7, 14B8	2A7, 12A8GT
7T7	7L7, 7G7, 7H7	6SG7, 6SH7GT, 6SD7GT, 6SE7GT	14H7	12SG7, 12SH7GT
7V7		6AB7/1853	14W7	
7W7		6AB7/1853	14W7	
7Y4	7Z4	84, 6W5G, 6X5GT/G, 0Z4, 6ZY5G	14Y4	
7Z4	7Y4	6X5GT/G, 6ZY5G, 0Z4, 84, 6W5G	14Y4	
12A	71A			
12A6GT		14A5		
12A8GT		14B8, MJ7, 14S7	6A8GT, 6D8G, 6J8G	2A7, 6A7, 7B8, 7J7, 7A8, 7S7

ORIGINAL	DIRECTLY INTERCHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
12AH7GT		12SN7GT, 14N7	6AH7GT	6SN7GT, 7N7, 6F8G
12C8		14E7	6B8GT	6B7, 7E7
12F5GT		12SF5GT	6F5GT, 6K5GT	6SF5GT, 7B4, 6AD5G
12H6			6H6GT	7A6
12J5GT		14A4	6J5GT, 6C5G, 6L5G	6C4, 7A4
12J7GT	12K7GT	14C7, 14A7/12B7, 12SJ7GT, 12SK7GT	6J7GT, 6W7G, 6U7G, 6K7GT, 6S7G	6SJ7GT, 6SK7GT, 6SS7, 7C7, 6C6, 57, 77, 7A7, 7B7, 58, 78, 6D6
12K7GT	12J7GT	12SK7GT, 12SJ7GT, 14C7, 14A7/12B7	6J7GT, 6W7G, 6U7G, 6K7GT, 6S7G	6SJ7GT, 6SK7GT, 6SS7, 7C7, 6C6, 57, 77, 7A7, 7B7, 58, 78, 6D6
12K8GT			6K8GT	
12Q7GT		12SQ7GT, 14B6	6Q7GT, 6T7G	7B6, 7C6, 75, 2A6, 6SQ7GT
12SA7GT/G		14Q7	6SA7GT	7Q7
12SC7	12SL7GT	14F7	6SC7GT	7F7, 6C8G, 6SL7GT
12SF5GT		12F5GT	6SF5GT	6F5GT, 6K5GT, 7B4, 6AD5G
12SF7		14E7, 12C8	6SF7	7E7, 6B8GT, 6B7
12SG7		14H7, 12SH7GT	6SG7, 6SH7GT, 6SD7GT	7H7, 7G7, 7L7, 7T7
12SH7GT		12SG7GT, 14H7	6SG7, 6SH7GT, 6SD7GT	7H7, 7G7, 7L7, 7T7
12SJ7GT/G	12SK7GT/G	12K7GT, 12J7GT, 14A7/12B7, 14C7	6SJ7GT, 6SS7, 6SK7GT	6J7GT, 6K7GT, 57, 77, 6C6, 7C7, 6W7G, 58, 78, 6D6, 6U7G, 6S7G, 7B7, 7A7
12SK7GT/G	12SJ7GT/G	12K7GT, 12J7GT, 14A7/12B7, 14C7	6SJ7GT, 6SS7, 6SK7GT	6J7GT, 6K7GT, 57, 77, 6C6, 7C7, 6W7G, 58, 78, 6D6, 6U7G, 6S7G, 7B7, 7A7
12SL7GT	12SC7	14F7	6SL7GT	6SC7GT, 7F7, 6C8G
12SN7GT		14AF7, 12AH7GT, 14N7	6SN7GT	6SH7GT, 7N7, 6F8G, 6AH7GT
12SQ7GT		14B6	6SQ7GT	6Q7GT, 6T7G, 7B6, 75
12SR7GT		14E6	6SR7GT, 6ST7	7E6
14A4		12J5GT	7A4	6J5GT, 6C8G, 6L5G
14A5		12A6GT	7A5	6U6GT, 6Y6G, 6W6GT
14A7/12B7	14C7	12SK7GT/G, 12K7GT, 12J7GT, 12SJ7GT	7A7, 7B7, 7C7	6D6, 78, 58, 6K7GT, 77, 6SK7GT, 6SS7, 6S7G, 6U7G, 57, 6K7GT, 7B7, 7A7, 6C6
14AF7	14N7	12AH7GT, 12SN7GT	7N7	6SN7GT, 6F8G, 6AH7GT

ORIGINAL	DIRECTLY INTERCHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
14B6		12SQ7GT/G, 12Q7GT	7B6, 7C6	75, 6T7G, 6Q7GT, 6SQ7G
14B8	14J7, 14S7	12A8GT	7B8, 7A8, 7J7, 7S7	6A7, 6A8GT, 6J8G, 6D8G, 2A7
14C5			7C5, 7B5	6V6GT/G, 6K6GT, 41, 42, 6F6GT, 2A5
14C7	14A7/12B7	12SJ7GT, 12J7GT, 12SK7GT, 12K7GT,	7A7, 7B7, 7C7	57, 6C6, 6J7G, 6D6, 78, 58, 6K7GT, 6SK7GT, 6SS7, 6S7G, 6U7G, 6S7G, 6K7G, 7B7, 7A7
14E6		12SR7GT	7E6	6SR7GT, 6ST7
14E7		12C8, 12SF7	7E7	6SF7, 6B7, 6B8GT
14F7		12SC7GT, 12SL7GT	7F7	6SL7GT, 6SC7GT, 6C8G
14H7		12SG7, 12SH7GT	7H7, 7G7, 7L7, 7T7	6SD7GT, 6SG7, 6SH7GT
14J7	14B8, 14S7	12A8GT	7J7, 7A8, 7B8, 7S7	6A8GT, 6D8G, 6A7, 2A7, 6J8G
14N7	14AF7	12AH7GT, 12SN7GT	7N7	6SN7GT, 6AH7GT 6F8G
14Q7		12SA7GT	7Q7	6SA7GT
14R7			7R7	
14S7	14B8, 14J7	12A8GT	7S7, 7A8, 7B8, 7J7	6A8GT, 6D8G, 6A7, 6J8G, 2A7
14W7			7W7	6AB7/1853
14Y4			7Y4, 7Z4	84, 6X5GT, 6W5G, 0Z4
19		1J6G		
24A	35/51			
25A6GT/G	25L6GT/G	43		
25B5		25N6G		
25C6G			50C6G	
25L6GT/G	25A6GT/G		50L6GT	50A5
25N6G		25B5		
25X6GT	25Z6GT/G	25Z5	50Y6GT, 50Z6G	
25Y4GT	25Z4			
25Z4	25Y4GT			
25Z5		25Z6GT, 25X6GT		50Y6GT, 50Z6G
25Z6GT	25X6GT	25Z5	50Y6GT, 50Z6GT	
27	56		37, 76	6AF5G, 6P5GT
30		1E4G, 1H4G, 1LE3, 1G4G		
32	34			
34	32			
35/51	24A			

ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
35A5		35L6GT		
35L6GT/G		35A5		
35Y4		35Z5GT/G		
35Z3		35Z4GT		
35Z4GT		35Z3		
35Z5GT/G		35Y4		
36	39/44			
37	76		27, 56	6AF5G, 6P5GT
39/44	36			
40	01A, 00A			
41	42	6K6GT/G, 6V6GT, 6F6GT, 7B5, 7C5	2A5	14C5
42	41	6F6GT, 6V6GT, 7B5, 7C5, 6K6GT	2A5	14C5
43		25A6GT/G		
45	2A3		6A3	6B4G, 6A5G
47		2A5		41, 42, 6V6GT, 6F6GT, 7B5, 7C5, 6K6GT
50A5		50L6GT		25L6GT
50C6G			25C6G	
50L6GT		50A5	25L6GT	
50Y6GT/G	50Z6G		25Z6GT	
50Z6G	50Y6GT/G		25Z6GT	
50Z7G	50Y6GT/G			
52	6A4/LA			
53			6A6	6N7GT
55			85	6V7G
56	27		76, 37, 6P5GT, 6AF5G	
57	58		77, 6C6, 6D6, 78	7C7, 6J7GT, 6W7G, 6SJ7GT, 12J7GT, 12SJ7GT, 12SK7GT, 6SK7GT, 12K7GT, 14A7/12B7, 14C7, 6K7GT, 6U7G, 7A7, 6SS7, 7B7, 6S7G
58	57		77, 6D6, 6C6, 78	7C7, 6J7GT, 6W7G, 6SJ7GT, 12J7GT, 12SJ7GT, 12SK7GT, 6SK7GT, 12K7GT, 14A7/12B7, 14C7, 6K7GT, 6U7G, 7A7, 6SS7, 7B7, 6S7G
70A7GT		70L7GT		
70L7GT		70A7GT		
71A	12A			

ORIGINAL	DIRECTLY INTERCHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
75		6T7G-6Q6G, 7K7, 6B6G, 7B6, 7C6, 6Q7GT, 6SQ7GT.	2A6	
VR75/30	0A3			
76	37	6P5GT, 6AF5G	56, 27	
77	6C6, 78	6SK7GT, 6SJ7GT, 6K7GT, 6J7GT, 7B7, 6SS7, 6S7G, 7A7, 6W7G, 6U7G, 7C7	57, 58	12J7GT, 12SJ7GT, 12K7GT, 12SK7GT, 14A7/12B7, 14C7
78	6C6, 77	6SK7GT, 6SJ7GT, 6K7GT, 6J7GT, 7B7, 6SS7, 6S7G, 7A7, 6W7G, 6U7G, 7C7	58, 57	12J7GT, 12SJ7GT, 12K7GT, 12SK7GT, 14A7/12B7, 14C7
79		6Y7G		
80	5X3	5W4GT, 5Y4G, 5Y3GT		
83V		5Z4GT, 5V4G		
84/6Z4		6X5GT/G, 6ZY5G, 6W5G, 7Y4, 7Z4, 0Z4*		
85		6V7G	55	
89		41		
VR90/30	0B3			
VR105/30	0C3			
117L/M7GT		117N7GT, 117P7GT		
117N7GT		117L/M7GT, 117P7GT		
117P7GT		117L/M7GT, 117N7GT		
VR150/30	0D3			
717A		6AK5, 6AG5		
950		1J5G, 1G5G		
954		9001		
955		9002		
956		9003		
CK1003/0Z4A			6X5GT/G	7Y4, 84
1231	7V7, 7W7			
1291	3B7/1291			
1294	1R4/1294			
1299	3D6/1299			
9001		954		
9002		955		
9003		956		
9006		9001, 9002, 9003		

NUMBERING CODES FOR RESISTOR & BALLAST VALVES

FOR AC-DC RECEIVERS USING 0.3 AMP. SERIES CONNECTED HEATERS

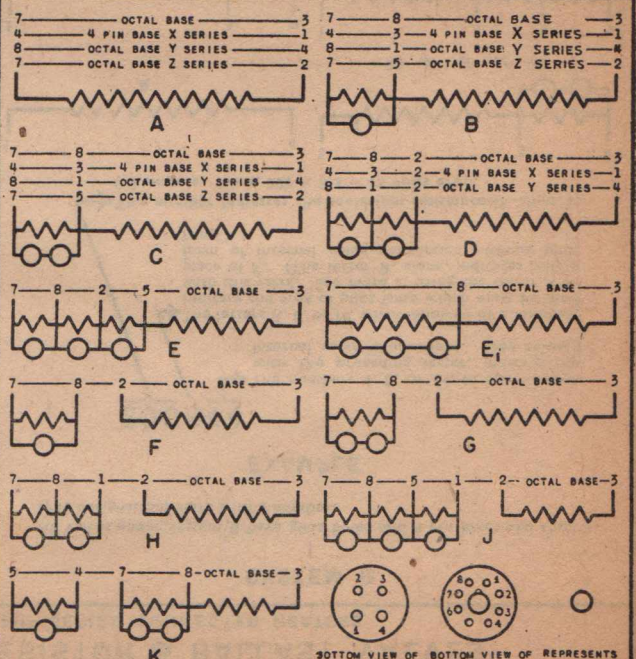
There are two Numbering Codes now in use for Ballast and Resistor Valves. Both Codes use parts of the type designation to indicate the various divisions of the Valve's service. For example, Type Numbers in the First System (A) might be BKX51DJ or L558 and, in the Second System (B), might be 200R44 or 200R. These letter and number combinations are explained by the following examples.

SYSTEM A

BKY49CJG

- The letter G, if present, indicates that the valve has a glass bulb and octal base
- The letter J, if present, indicates that a jumper is located between pins 3 and 4.
- Letters A to K here indicate the internal circuit connections. (See adjacent figures.)
- This number gives the voltage drop with 0.3 ampere. (See Note 4.)
- The letters X, Y, or Z, if present, indicate the style of base and the pin connections. (See Note 3.)
- The letters K, L, or M indicate the type of pilot lamp that must be used with this valve. (See Note 2.)
- The letter B, when present, indicates that the pilot-lamp shunt-resistor is a ballast type. (See Note 1.)

System A (Notes) continued below.


7 OCTAL BASE 3
4 4 PIN BASE X SERIES 1
8 OCTAL BASE Y SERIES 4
7 OCTAL BASE Z SERIES 2
A
7 8 OCTAL BASE 3
4 3 4 PIN BASE X SERIES 1
8 1 OCTAL BASE Y SERIES 4
7 5 OCTAL BASE Z SERIES 2
B
C
7 8 2 OCTAL BASE 3
4 3 2 4 PIN BASE X SERIES 1
8 1 2 OCTAL BASE Y SERIES 4
D
7 8 2 5 OCTAL BASE 3
E
7 8 OCTAL BASE 3
Ei
7 8 2 OCTAL BASE 3
F
G
7 8 1 2 OCTAL BASE 3
H
7 8 5 1 2 OCTAL BASE 3
J
5 4 7 8 OCTAL BASE 3
K
BOTTOM VIEW OF 4 PIN BASE
BOTTOM VIEW OF OCTAL BASE
REPRESENTS PILOT LAMP

NUMBERING CODES FOR RESISTOR & BALLAST VALVES

FOR AC-DC RECEIVERS USING 0.3 AMP. SERIES CONNECTED HEATERS

SYSTEM A (CONTINUED).

NOTE 1.

"Ballast" Action indicates that the pilot lamp shunt resistor has low starting resistance when cold, protecting the lamp filament from the initial current surge, and has much higher resistance when hot, applying full operating voltage to the lamp.

NOTE 2.

Tube Letter	Lamp No.	Volts	Amperes	Bead Colour
K	40 and 47	6.3	0.15	Brown
L	44 and 46	6.3	0.25	Blue
M	50 and 51	7.5	0.2	White

NOTE 3.

X denotes a 4 pin base and metal shell. Y or Z denote octal bases but with different pin connections. (See Figures A to K.)

NOTE 4.

This number includes the drop in the series resistor plus the drop in the pilot lamp and its shunt. The number represents the difference between the sum of the heater voltages and the line voltage of 117.5 volts. Valves are made with the following numbers: 98, 92, 86, 80, 73, 67, 61, 55, 49, 42, 36, 30, 23, 17, 11. The number to be used is the one closest to the voltage difference mentioned above.

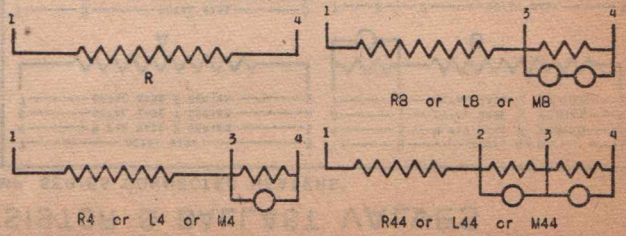
SYSTEM B

All valves under System B have glass bulbs and 4 pin bases and their type designations start with a number.

EXAMPLE

200R44

- The numbers 4, 8, or 44, in combination with the preceding letter, indicate the internal valve connections. (See below.)
- The letters R, L, or M, when followed by a number, indicate the type of pilot lamp which must be used with this valve. See Note 2, using the letter R in place of K. (The letter R, alone, indicates only a form of internal valve connection without pilot lamp.)
- This number indicates the equivalent resistance in ohms at 0.3 ampere. Thus, 200 × 0.3 = 60 volts drop.



AMERICAN V.T. vs. R.M.A.

VALVE TYPE DESIGNATION.

CROSS REFERENCE.

VT	RMA	VT	RMA	VT	RMA
1	WE203A	72	842	121	955
2	WE205B	73	843	124	1A5GT
4B	211	74	5Z4	125	1C5GT
4C	211SPEC	75	75	126	6X5
5	WE215A	76	76	126A	6X5G
6	212A	77	77	126B	6X5GT/G
7	WX12	78	78	128	1630
8	UV204	80	80	129	304TL
17	860	83	83	130	250TL
19	861	84	84/6Z4	131	12SK7
22	204A	86	6K7	132	12K8
24	864	86A	6K7G	133	12SR7
25	10	86B	6K7GT	134	12A6
25A	10Y-10SPEC	87	6L7	135	12J5GT
26	22	87A	6L7G	135A	12J5
27	30	88	6R7	136	1625
28	24A	88A	6R7G	137	1626
29	27	88B	6R7GT	138	1629
30	01A	89	89	139	OD3/VR150
31	31	90	6H6	141	WL531
33	33	90A	6H6GT/G	143	805
34	207	91	6J7	144	813
35	35/51	91A	6J7GT	145	5Z3
36	36	92	6Q7	146	1N5GT
37	37	92A	6Q7G	147	1A7GT
38	38	93	6B8	148	1D8GT
39	869	93A	6B8G	149	3A8GT
39A	869A	94	6J5	150	6SA7
40	40	94A	6J5G	150A	6SA7GT/G
41	851	94D	6J5GT/G	151	6A8G
42	872	95	2A3	151B	6A8GT
42A	872A	96	6N7	152	6K6GT/G
43	845	97	5W4	152A	6K6G
44	32	98	6U5/6G5	153	12C8Y (SPEC)
45	45	99	6F8G	154	814
46	866	100	807	161	12SA7
46A	866A	100A	807SPEC	162	12SJ7
47	47	101	837	163	6C8G
48	41	103	6SQ7	164	1619
49	39/44	104	12SQ7	165	1624
50	50	105	6SC7	166	371A
51	841	106	803	167	6K8
52	45SPEC	107	6V6	167A	6K8G
54	34	107A	6V6GT/G	168A	6Y6G
55	865	107B	6V6G	169	12C8
56	56	108	450TH	170	1E5GP
57	57	109	2051	171	1R5
58	58	111	5BP4/1802P4	172	1S5
60	850	112	6AC7/1852	173	1T4
62	801/801A	114	5T4	174	3S4
63	46	115	6L6	175	1613
64	800	115A	6L6G	176	6AB7/1853
65	6C5	116	6SJ7	177	1LH4
65A	6C5G	116A	6SJ7GT	178	1LC6
66	6F6	116B	6SJ7Y (SPEC)	179	1LN5
66A	6F6G	117	6SK7	180	3LF4
67	30SPEC	117A	6SK7GT/G	181	7Z4
68	6B7	118	832	182	3B7/1291
69	6D6	119	2X2/879	183	1R4/1294
70	6F7	120	954	184	OB3/VR90

V.T. vs. R.M.A.—continued.

VT	RMA	VT	RMA	VT	RMA
185	3D6/1299	213A	6L5G	243	7C4/1203A
187	575A	214	12H6	244	5U4G
188	7E6	215	6E5	245	2050
189	7F7	216	816	246	918
190	7H7	217	811	247	6AG7
191	316A	218	100TH	248	3CP1/1808P1
192	7A4	220	250TH	249	1006
193	7C7	221	3Q5GT	250	EF50
194	7J7	222	884	251	WL441 SERIES
195	1005	223	1H5GT	252	923
196	6W5G	224	2C34-RK34	254	304TH
197A	5Y3GT/G	225	307A	255	705A
198A	6G6G	226	3EP1/1806P1	256	GL486
199	6SS7	227	7184	257	K-7
200	OC3/VR105	228	8012	259	829
201	25L6	229	6SL7GT	260	OA3/VR-75
201C	25L6GT/G	230	350A	264	3Q4
202	9002	231	6SN7GT	266	1616
203	9003	232	E1148	267	WL578
204	3C24	233	6SR7	268	12SC7
205	6ST7	234	114B	269	717A
206A	5V4G	235	615	277	417
207	12AH7GT	236	836	279	GY2
208	7B8	237	957	282	ZG489
209	12SG7	238	956	286	832A
210	1S4	239	1LE3	287	815
211	6SG7	240	710A	288	12SH7
212	958	241	7E5/1201	289	12SL7GT

AMERICAN R.M.A. vs. V.T.

VALVE TYPE DESIGNATION.

CROSS REFERENCE.

RMA	VT	RMA	VT	RMA	VT
01A	30	3CP1/1808P1	248	6F6	66
0A3/VR-75	260	3D6/1299	185	6F6G	66A
0B3/VR-90	184	3EP1/1806P1	226	6F7	70
0C3/VR-105	200	3LF4	180	6F8G	99
0D3/VR-150	139	3Q4	264	6G6G	198A
1A5GT	124	3Q5GT	221	6H6	90
1A7GT	147	3S4	174	6H6GT/G	90A
1C5GT	125	5BP4/1802P4	111	6J5	94
1D8GT	148	5T4	114	6J5G	94A
1E5GP	170	5U4G	244	6J5GT/G	94D
1H5GT	223	5V4G	206A	6J7	91
1LC6	178	5W4	97	6J7GT	91A
1LE3	239	5Y3GT/G	197A	6K6G	152A
1LH4	177	5Z3	145	6K6GT/G	152
1LN5	179	5Z4	74	6K7	86
1N5GT	146	6A8G	151	6K7G	86A
1R4/1294	183	6A8GT	151B	6K7GT	86B
1R5	171	6AB7/1853	176	6K8	167
1S4	210	6AC7/1852	112	6K8G	167A
1S5	172	6AG7	247	6L5G	213A
1T4	173	6B7	68	6L6	115
GY2	279	6B8	93	6L6G	115A
2A3	95	6B8G	93A	6L7	87
2C34-RK34	224	6C5	65	6L7G	87A
2X2/879	119	6C5G	65A	6N7	96
3A8GT	149	6C8G	163	6Q7	92
3B7/1291	182	6D6	69	6Q7G	92A
3C24	204	6E5	215	6R7	88

RMA	VT	RMA	VT	RMA	VT
6R7G	88A	30	27	801/801A	62
6R7GT	88B	30SPEC	67	803	106
6SA7	150	31	31	805	143
6SA7GT/G	150A	32	44	807	100
6SC7	105	33	33	807-SPEC	100A
6SG7	211	34	54	811	217
6SJ7	116	35/51	35	813	144
6SJ7GT	116A	36	36	814	154
6SJ7Y (SPEC)	116B	37	37	815	287
6SK7	117	38	38	816	216
6SK7GT/G	117A	39/44	49	829	259
6SL7GT	229	40	40	832	118
6SN7GT	231	41	48	832A	286
6SQ7	103	45	45	836	236
6SR7	233	45SPEC	52	837	101
6SS7	199	46	63	841	51
6ST7	205	47	47	842	72
6U5/6G5	98	50	50	843	73
6V6	107	EF50	250	845	43
6V6G	107B	56	56	850	60
6V6GT/G	107A	57	57	851	41
6W5G	196	58	58	860	17
6X5	126	75	75	861	19
6X5G	126A	76	76	864	24
6X5GT/G	126B	77	77	865	55
6Y6G	168A	78	78	866	46
6Z4/84	84	80	80	866A	46A
K-7	257	83	83	869	39
7A4	192	84/6Z4	84	869A	39A
7B8	208	89	89	872	42
7C4/1203A	243	100TH	218	872A	42A
7C7	193	114B	234	879/2X2	119
7E5/1201	241	WE203A	1	884	222
7E6	188	UV204	8	918	246
7F7	189	204A	22	923	252
7H7	190	WE205B	2	954	120
7J7	194	207	34	955	121
7Z4	181	211	4B	956	238
10	25	211SPEC	4C	957	237
10Y-SPEC	25A	212A	6	958	212
WX12	7	WE215A	5	1005	195
12A6	134	250TH	220	1006	249
12AH7GT	207	250TL	130	E1148	232
12C8	169	304TH	254	1201/7E5	241
12C8Y-SPEC	153	304TL	129	1203A/7C4	243
12H6	214	307A	225	1291/3B7	182
12J5	135A	316A	191	1294/1R4	183
12J5GT	135	350A	230	1299/3D6	185
12K8	132	371A	166	1613	175
12SA7	161	417	277	1616	266
12SC7	268	WL441 SERIES	251	1619	164
12SG7	209	450TH	108	1624	165
12SH7	288	GL486	256	1625	136
12SJ7	162	ZG489	282	1626	137
12SK7	131	WL531	141	1629	138
12SL7GT	289	575A	187	1630	128
12SQ7	104	WL578	267	2050	245
12SR7	133	615	235	2051	109
22	26	705A	255	7184	227
24A	28	710A	240	8012	228
25L6	201	717A	269	9002	202
25L6GT/G	201C	800	64	9003	203
27	29				

DESIGNATIONS

(a) DESIGNATION INDICATION OF OLD TYPE CONTINENTAL VALVES.

This type indication consists of a letter and a number of three or four figures. The letter gives an indication of the value of the heater current as follows:—

A	means	a	heater	current	of	0.06 to 0.10 A
B	„	„	„	„	„	0.10 to 0.20 A
C	„	„	„	„	„	0.20 to 0.40 A
D	„	„	„	„	„	0.40 to 0.70 A
E	„	„	„	„	„	0.70 to 1.25 A
F	„	„	„	„	„	1.25 A and more.

The first figure or when the number consists of four figures the two first figures give the heater tension. The two last figures indicate the amplification factor of a triode or in the case of a valve with more grids the exact type, as follows:—

41, 51, etc., are tetrodes with space charge grid.
42, 52, etc., are H.F. screen-grid valves.
43, 53, etc., are pentode-output valves.
44, 54, etc., are diode-tetrodes.
45, 55, etc., are variable-mu tetrodes.
46, 56, etc., are H.F. pentodes.
47, 57, etc., are H.F. variable-mu pentodes.
48, 58, etc., are hexode frequency-chargers (mixers).
49, 59, etc., are variable-mu hexodes.

Examples:—

A valve with type indication A409 is a triode with a heater current of 0.065 A; the heater voltage is 4 V and the amplification factor is 9.

A valve B2099 is a triode with a heater current of 0.18 A, a heater voltage of 20 V, and an amplification factor of 99.

A valve C443 is a pentode output valve with a heater current of 0.25 A, and a heater voltage of 4 V.

A valve E448 is a hexode frequency-charger with a heater current of 1.2 A, and a heater voltage of 4 V.

(b) DESIGNATION INDICATION OF MODERN TYPE CONTINENTAL VALVES.

This type indication consists of two or three letters followed by a number. The meaning of the letters is as follows:—

First Letter	Second Letter
A—4 V A.C. types	A—single diode
B—180 mA. D.C. types	B—double diode
C—200 mA. A.C./D.C. types	C—triode (except output valve)
D—1.2 V and 1.4 V battery types	D—triode output valve
E—6.3 V A.C. types and motor-car radio types	E—tetrode
	F—H.F. pentode

First Letter	Second Letter
F—13 V motor-car radio types	H—hexode or heptode
K—2 V battery types	K—octode
U—100 mA. A.C./D.C. types	L—pentode output valve
V—50 mA. A.C./D.C. types	M—electron ray indicator
	X—gas-filled full-wave rectifier
	Y—H.V. half-wave rectifier
	Z—H.V. full-wave rectifier

Examples:—

(a) The UBL21 is a duodiode power-output pentode for 100 mA. A.C./D.C. series connection. The EF22 is an H.F. pentode with a heater voltage of 6.3 V, the EAB1 is a threefold diode with a heater voltage of 6.3 V.

(b) The EFF51 is a twin H.F. pentode for 6.3 heater voltage working.

(c) TYPE INDICATION FOR VOLTAGE STABILISERS.

The type indication of the modern voltage stabiliser valves consists of a number, a letter and a second number. The first number indicates the average value of the stabilised voltage, the letter gives the maximum admissible current as follows:—

A—0 to 8 mA.	D—40 to 100 mA.
B—8 to 20 mA.	E—100 to 200 mA.
C—20 to 40 mA.	

The number after the letter shows the sequence of production.

Example:—

The 100E1 is designed to stabilise an average voltage of 100 V. The maximum admissible current is 200 mA. The figure 1 means that this valve is the first execution of this type.

C.V. VALVES AND THEIR COMMERCIAL EQUIVALENTS.

It will be noted that immediately following the commercial equivalent type number, appears a letter enclosed in a bracket. This indicates the manufacturer of the commercial equivalent and the abbreviations that have been used are as follows.

A—American
B—British Thomson-Houston
C—Cossor
D—Mazda
E—Ediswan
F—Electrical & Musical Industries
G—General Electric Co. of Britain
H—Ministry of Supply
M—Mullard
N—British Admiralty
O—Marconi Osram Valve Co.
P—Philips
Q—Hivac
S—Standard Telephone & Cables
T—Tungsram

C.V. No.	Commercial Equivlaent	C.V. No.	Commercial Equivalent	C.V. No.	Commercial Equivalent
3	E1228 (G)	73	V1120B (E)	139	V738 (H)
5	GU21 (Q)	74	XP (Q)	140	V984 (D)
6	E1148 (G)	75	4313C (S)	142	U2 (O)
8	E1248 (G)	78	E1474 (G)	143	U3 (O)
9	AL60 (M)	79	E1379 (G)	144	U4 (O)
12	E1191 (G)	82	S27A (S)	145	U5 (O)
13	BT9B (B)	84	3B/102B (S)	147	U7 (O)
15	E1266 (G)	85	V2023 (E)	148	U8 (O)
18	DET19 (O)	86	V1507 (H)	152	GU21 (O)
19	EHT1 (O)	87	KRN2 (F)	153	E1411 (G)
20	V1906 (D)	88	DV32 (S)	155	E1190 (G)
22	BT45 (B)	89	E1380 (G)	171	W21 (O)
24	HL41 (O)	90	E1368 (G)	172	E1468 (G)
25	4242A (S)	92	E1232 (G)	173	DDR2 (H)
26	813 (A)	93	V625 (P)	174	E1459 (G)
27	4357A (S)	94	DS103 (O)	176	XP1.5 (Q)
28	ACT9 (O)	100	V1924 (E)	178	E1458 (G)
29	E1235 (G)	105	E1371 (G)	181	ECC31 (M)
30	4270A (S)	110	VS68 (H)	185	PM202 (M)
31	U20 (M)	114	E1365 (G)	187	U19 (O)
32	866 (A)	115	E1415 (G)	188	E1436 (G)
33	4077A (S)	116	KR6/1 (F)	190	DLS10 (E)
34	MR10 (O)	117	E1417 (G)	191	E1494 (G)
39	S22AF (S)	118	VR65 (H)	192	E1481 (G)
41	E1267 (G)	119	XJ (Q)	199	NT99 (N)
42	E1256 (G)	121	V1920 (E)	200	MZ2-200 (D)
45	S130 (C)	122	E1336 (G)	201	V630 (H)
49	3B/501A (S)	123	E1330 (G)	207	ACP4 (E)
51	E1320 (G)	124	807 (A)	208	E1487 (G)
52	E1231 (G)	125	V2024 (E)	214	E1531 (G)
53	S26A (S)	126	E1362 (G)	215	E1497 (G)
54	VU133A (H)	127	S30A (O)	216	VR150 (A)
55	E1190 (G)	128	SU750 (C)	221	E1516 (G)
57	E1271 (G)	129	KRN2A (F)	222	E1489 (G)
58	E1273 (G)	131	V884 (E)	225	ACT17 (O)
63	E1323 (G)	133	6C4 (A)	229	E1336 (G)
64	E1342 (G)	135	DDR3 (H)	230	DV55 (S)
65	PEN25 (D)	136	DDR7 (H)	236	E1465 (G)
66	RL37 (M)	137	DDR26 (H)	240	E1496 (G)
72	V1120 (E)	138	V888 (D)	242	GS18 Cine-Tele

C.V. No.	Commercial Equivalent	C.V. No.	Commercial Equivalent	C.V. No.	Commercial Equivalent
243	4045A (S)	558	25Z6 (A)	636	836 (A)
244	4046A (S)	559	25Z6GT (A)	637	837 (A)
245	4328D (S)	561	35L6 (A)	638	838 (A)
248	GS16 Cine-Tele	562	35L6GT (A)	639	843 (A)
249	4019A (S)	564	35Z3 (A)	640	860 (A)
257	E1457 (G)	565	35Z3GT (A)	641	861 (A)
259	E1495 (G)	567	35Z5 (A)	642	872 (A)
261	2T/270K (S)	568	35Z5GT (A)	643	874 (A)
278	E1606 (G)	571	50L6GT (A)	644	875 (A)
281	X61M (O)	572	6X5G (A)	645	876 (A)
283	6AL5 (A)	573	6X5 (A)	647	884 (A)
290	E1527 (G)	574	6X5GT (A)	648	885 (A)
302	ECH22 (M)	575	5U4G (A)	649	956 (A)
303	EF22 (M)	578	6A8G (A)	650	958 (A)
304	EL22 (M)	579	6A8 (A)	651	991 (A)
305	EV51 (M)	580	6A8GT (A)	652	1603 (A)
324	GU8 (O)	581	6C5G (A)	653	1611 (A)
327	EF52 (M)	582	6C5 (A)	654	1612 (A)
346	EZ22 (M)	583	6C5GT (A)	655	1613 (A)
347	EBC21 (M)	585	6C6 (A)	656	1616 (A)
358	EF37 (M)	587	6Q7G (A)	657	1620 (A)
379	ACT19 (O)	588	6Q7 (A)	658	1622 (A)
384	DET5 (O)	589	6Q7GT (A)	659	1625 (A)
385	CK502 (A)	590	6SJ7G (A)	660	6AC7 (A)
386	CK505 (A)	591	6SJ7 (A)	661	6AB7 (A)
387	CK506 (A)	592	6SJ7GT (A)	662	8012 (A)
391	LS650 (S)	594	6SH7 (A)	663	8025 (A)
500	6T7G (A)	595	6SH7GT (A)	664	9002 (A)
501	EBF32 (M)	596	45 (A)	665	9003 (A)
502	LD210 (T)	597	879 (A)	666	9004 (A)
503	5W4DT (A)	598	715C (A)	667	9005 (A)
504	6U5/6G5 (A)	599	1851 (A)	668	35T (A)
505	MT16 (O)	600	5CP1 (A)	669	279A (A)
506	GL8023 (A)	603	10 (A)	670	645 (A)
508	1B49 (A)	604	30 (A)	676	7206A (A)
509	6V6G (A)	606	37 (A)	677	701A (A)
510	6V6 (A)	608	41 (A)	679	703A (A)
511	6V6GT (A)	609	42 (A)	683	316A (A)
512	6W7G (A)	610	45 (A)	684	274B (A)
515	6Y6G (A)	611	56 (A)	686	VR105 (A)
517	OZ4A (A)	612	57 (A)	687	GL446B (A)
520	VP2B (M)	613	58 (A)	688	2C43 (A)
522	7B7 (A)	614	75 (A)	690	RK48A (A)
523	12Y4 (A)	615	76 (A)	691	357A (A)
525	12A6 (A)	616	77 (A)	692	OZ4 (A)
526	12A6GT (A)	617	80 (A)	693	HF300 (A)
529	12AH7GT (A)	618	83 (A)	694	12SG7 (A)
531	12C8 (A)	619	84 (A)	695	700B (A)
534	12J5 (A)	620	211 (A)	696	700C (A)
535	12J5GT (A)	621	801 (A)	697	12SJ7 (A)
537	12SA7 (A)	622	802 (A)	698	12SJ7GT (A)
538	12SA7GT (A)	623	803 (A)	699	700D (A)
540	12SC7 (A)	624	804 (A)	700	12SR7 (A)
543	12SK7 (A)	625	805 (A)	702	830B (A)
544	12SK7GT (A)	626	808 (A)	703	12K8 (A)
546	12SQ7 (A)	627	810 (A)	704	RK20A (A)
547	12SQ7GT (A)	628	811 (A)	705	1D5GP (A)
549	25A6 (A)	629	814 (A)	706	6U7G (A)
550	25A6GT (A)	630	826 (A)	707	HK54 (A)
551	25L6G (A)	631	828 (A)	709	RX235 (A)
552	25L6 (A)	632	829 (A)	710	368A (A)
553	25L6GT (A)	634	832 (A)	711	32 (A)
555	25Z5 (A)	635	833 (A)	712	38 (A)

C.V. No.	Commercial Equivalent	C.V. No.	Commercial Equivalent	C.V. No.	Commercial Equivalent
716	8013A (A)	798	2E22 (A)	882	7B6LM (A)
717	5R4GY (A)	802	2C26 (A)	883	7B8LM (A)
718	5FP7 (A)	803	2V3 (A)	884	7BP7 (A)
719	2J21A (A)	804	2V3G (A)	885	7C5 (A)
723	1619 (A)	805	50Y6GT (A)	886	7C5LT (A)
724	816 (A)	807	3A4 (A)	887	7C6 (A)
725	1B24 (A)	808	3A5 (A)	888	7D7 (S)
726	35Z3 (A)	809	3A/105B (S)	889	7D8 (A)
727	1N21 (A)	811	1291 (A)	890	7E5 (A)
728	1P5GT (A)	812	3B22 (A)	891	7E6 (A)
729	5V4G (A)	814	3BP1 (A)	892	7E7 (A)
730	6A3 (A)	815	1299 (A)	893	7F7 (A)
731	6F6GT (A)	816	3DP1 (A)	894	1232 (A)
732	6W4 (A)	818	3Q4 (A)	895	7H7 (A)
734	228A (A)	819	3Q5 (A)	896	7K7 (A)
735	845 (A)	820	3S4 (A)	897	7J7 (A)
736	905 (A)	822	EL3C (P)	898	7N7 (A)
737	906 (A)	823	4C29 (A)	899	7Q7 (A)
738	953 (A)	824	HK257 (A)	900	7R7 (A)
742	FG67 (A)	825	4SHA (C)	901	7Y4 (A)
750	O1A (A)	826	4THA (C)	902	7W7 (A)
751	HY75 (A)	828	4TPB (C)	904	892R (A)
752	OA4G (A)	830	4TSP (C)	906	1602 (A)
753	1A3 (A)	833	89 (A)	908	12A5 (A)
754	1A4P (A)	834	5B/300B (S)	909	12A7 (A)
755	1A5G (A)	837	12C8SPEC (A)	910	12A8GT (A)
756	1A5GT (A)	840	5H4 (A)	911	12B8GT (A)
757	1A6 (A)	841	5U4GT (A)	916	12H6 (A)
758	1B4P (A)	542	5W4G (A)	917	12J7 (A)
759	1B5 (A)	843	6AB5 (A)	918	12K7 (A)
760	1B7GT (A)	844	6AC5G (A)	919	12SF5 (A)
761	1B22 (A)	845	6AC5GT (A)	920	12SF5GT (A)
764	1D5 (A)	846	6AC7 (A)	921	12SF7 (A)
765	1D7G (A)	847	6AF6G (A)	922	12SH7 (A)
766	1E5GT (A)	848	6AG5 (A)	924	12SL7 (A)
767	1F4 (A)	849	6AJ7 (A)	925	12SN7 (A)
768	1F5G (A)	850	6AK5 (A)	927	12Z3 (A)
769	1F6 (A)	851	6B4G (A)	929	13SPA (C)
770	1F7GV (A)	852	6C4 (A)	930	14F7 (A)
771	1G5G (A)	854	6C7 (A)	931	15 (A)
772	1G6G (A)	855	6C21 (A)	932	2C40 (A)
773	1G6GT (A)	856	6G8G (A)	933	4C30 (A)
774	1H4G (A)	857	6H7 (A)	934	4B30 (A)
775	1LA6 (A)	858	6J6 (A)	936	24A (A)
776	1LB4 (A)	859	6J8G (A)	937	25A7 (A)
777	1LC5 (A)	860	6K5G (A)	938	25AC5 (A)
778	LLC6 (A)	861	6K5GT (A)	939	25B6 (A)
779	1LD5 (A)	862	6L5G (A)	940	25B8 (A)
780	1LH4 (A)	864	6P7G (A)	941	HK24 (A)
781	1LN5 (A)	865	6SD7GT (A)	942	25Y5 (A)
782	1R5 (A)	866	6SJ7Y (A)	943	26 (A)
783	1S4 (A)	867	6SR7 (A)	944	27 (A)
784	1S5 (A)	870	6V7G (A)	945	28D7 (A)
785	1T4 (A)	871	6Z5 (A)	946	28D7GT (A)
786	1T5 (A)	872	6Z7G (A)	947	31 (A)
787	2A7 (A)	873	6ZY5G (A)	948	32L7 (A)
788	832A (A)	875	2C21 (A)	949	33 (A)
789	3C24 (A)	876	7A6 (A)	977	TWINCV55 (G)
792	2C22 (A)	877	7A7 (A)	995	6AJ5 (A)
794	2D2 (M)	878	7A8 (A)	996	1637 (A)
795	2D4A (M)	879	7B4 (A)	998	2000T (A)
796	2D13C (M)	880	7B5 (A)	999	3C22 (A)
797	2D21 (A)	881	7B5LT (A)	1000	VR109A (H)

C.V. No.	Commercial Equivalent	C.V. No.	Commercial Equivalent	C.V. No.	Commercial Equivalent
1001	VU120A (H)	1756	1629 (A)	1885	6B5 (A)
1002	VT501A (H)	1757	9001 (A)	1887	6B6G (A)
1018	215SG (C)	1758	1L4 (A)	1891	6B7 (A)
1059	955 (A)	1759	2C26A (A)	1893	6B8G (A)
1076	TZ40 (A)	1762	6AK6 (A)	1894	6B8 (A)
1078	2B36 (A)	1763	6J4 (A)	1896	6C8G (A)
1088	832 (A)	1769	2A6 (A)	1900	6D6 (A)
1095	954 (A)	1770	7A4 (A)	1902	6D8G (A)
1400	C1C (P)	1771	39/44 (A)	1906	6E5 (A)
1401	CL33 (M)	1772	47 (A)	1908	6F5G (A)
1402	CY31 (M)	1773	82 (A)	1909	6F5 (A)
1403	DD41 (E)	1774	112A (A)	1910	6F5GT (A)
1405	E1199 (G)	1775	36 (A)	1911	6FG (A)
1407	Pen45 (E)	1776	6D7 (A)	1912	6F6 (A)
1408	P41 (E)	1777	7C7 (A)	1915	6F7 (A)
1409	SP2 (M)	1778	101D (A)	1917	6F8G (A)
1410	TH2 (M)	1779	102D (A)	1918	6F8 (A)
1411	TH41 (D)	1780	30TWIN (A)	1926	6G6G (A)
1412	TV4 (M)	1781	310B (A)	1929	6H6G (A)
1413	UU6 (D)	1782	340A (A)	1930	6H6 (A)
1415	4011A (S)	1784	6AK7 (A)	1931	6H6GT (A)
1419	11D3 (S)	1790	7Z4 (A)	1932	6J5G (A)
1420	4078A (S)	1794	759 (A)	1933	6J5 (A)
1422	3D/100A (S)	1796	DW4/350 (M)	1934	6J5GT (A)
1424	20A1 (S)	1797	4081A (S)	1935	6J7G (A)
1425	7D5 (A)	1798	2051 (A)	1936	6J7 (A)
1426	EK2 (M)	1799	350B (A)	1937	6J7GT (A)
1427	EF9 (M)	1800	1A7G (A)	1938	6K6G (A)
1428	EBC3 (M)	1802	1A7GT (A)	1940	6K6GT (A)
1429	EL2 (M)	1803	1C5G (A)	1941	6K7G (A)
1430	ACSP3 (E)	1805	1C5GT (A)	1942	6K7 (A)
1431	ACT16 (O)	1806	1D5GT (A)	1943	6K7GT (A)
1433	EC31 (M)	1811	1D8GT (A)	1944	6K8G (A)
1434	EM4 (M)	1812	1E7G (A)	1945	6K8 (A)
1435	GU20 (O)	1815	6Q5G (A)	1946	6K8GT (A)
1438	KT61 (O)	1816	6Y3G (A)	1947	6L6G (A)
1439	MT9F (O)	1817	1G4 (A)	1948	6L6 (A)
1440	MT9L (O)	1818	1H5G (A)	1950	6L7G (A)
1441	MT12A (O)	1819	6P5GT (A)	1951	6L7 (A)
1442	MT14 (O)	1820	1H5GT (A)	1953	6N6G (A)
1443	U10 (O)	1821	1N5G (A)	1954	6N6 (A)
1444	42SPT (C)	1823	1N5GT (A)	1956	6N7G (A)
1445	4012A (S)	1824	1Q5G (A)	1957	6N7 (A)
1446	4017B (S)	1826	1Q5GT (A)	1958	6N7GT (A)
1447	4030C (S)	1829	1T5GT (A)	1960	6R6G (A)
1449	4064B (S)	1831	2A3 (A)	1962	6R7G (A)
1450	4228A (S)	1834	2A5 (A)	1963	6R7 (A)
1451	4274A (S)	1837	2B7 (A)	1964	6R7GT (A)
1452	4300A (S)	1846	5T4 (A)	1966	6SA7 (A)
1455	225DU (C)	1849	5W4 (A)	1967	6SA7GT (A)
1456	Pen383 (E)	1851	5X4G (A)	1969	6SC7 (A)
1457	VP133 (E)	1852	5X4 (A)	1970	6SC7GT (A)
1458	41MP (C)	1854	5Y3G (A)	1972	6SF5 (A)
1459	MU2 (O)	1856	5Y3GT (A)	1973	6S5GT (A)
1460	X41 (O)	1857	5Y4G (A)	1974	6S7G (A)
1462	A915 (O)	1861	5Z3 (A)	1975	6S7 (A)
1463	CBL31 (M)	1863	5Z4G (A)	1978	6SG7 (A)
1471	4049A (S)	1864	5Z4 (A)	1981	6SK7 (A)
1751	34 (A)	1867	6A6 (A)	1982	6SK7GT (A)
1752	35/51 (A)	1870	6A7 (A)	1985	6SL7GT (A)
1753	35A5 (A)	1873	6AB7 (A)	1988	6SN7GT (A)
1754	35TG (A)	1878	6AD7G (A)	1990	6SQ7 (A)
1755	1626 (A)	1882	6AG7 (A)	1991	6SQ7GT (A)

C.V. No.	Commercial Equivalent	C.V. No.	Commercial Equivalent	C.V. No.	Commercial Equivalent
1993	6SS7 (A)	2594	258B (A)	2680	868 (A)
1995	6ST7G (A)	2595	259A (A)	2683	878 (A)
1996	6ST7 (A)	2597	262B (A)	2685	880 (A)
1999	1V (A)	2598	264A (A)	2686	889 (A)
2500	35Z4GT (A)	2599	264C (A)	2689	889R (A)
2501	40 (A)	2600	267B (A)	2688	891R (A)
2502	41FP (C)	2601	271A (A)	2689	893R (A)
2503	41MH (C)	2602	272A (A)	2690	904V (M)
2504	41MHL (C)	2603	274A (A)	2691	913 (A)
2505	41MPG (C)	2604	275A (A)	2692	918 (A)
2506	41MPT (C)	2605	282A (A)	2693	929 (A)
2508	41STH (C)	2608	300A (A)	2694	930 (A)
2511	420T (C)	2609	300B (A)	2695	931 (A)
2512	420TDD (C)	2611	304TH (A)	2696	931A (A)
2514	43 (A)	2612	307A (A)	2697	935 (A)
2529	45IU (C)	2613	310A (A)	2700	957 (A)
2530	45Z5 (A)	2614	311A (A)	2701	958A (A)
2531	46 (A)	2615	313C (A)	2704	7E5/1201 (A)
2532	49 (A)	2616	314A (A)	2705	1203 (A)
2533	50 (A)	2617	323A (A)	2706	7C4/1203A (A)
2534	50L6 (A)	2618	327A (A)	2707	1231 (A)
2535	53 (A)	2619	328A (A)	2709	1294 (A)
2536	53A (A)	2620	329A (A)	2710	3D6/1299 (A)
2537	55 (A)	2621	330B (A)	2711	1500T (A)
2538	59 (A)	2622	331A (A)	2712	1609 (A)
2541	71A (A)	2623	332A (A)	2713	1610 (A)
2543	73 (A)	2624	337A (A)	2714	1614 (A)
2544	78 (A)	2625	338A (A)	2715	1630 (A)
2545	79 (A)	2626	346A (A)	2716	6SC7(SEL) (A)
2546	81 (A)	2627	349A (A)	2717	1729 (M)
2547	83V (A)	2628	349B (A)	2718	1876 (P)
2548	84 (A)	2629	350A (A)	2719	1924 (P)
2549	85 (A)	2630	351A (A)	2722	3025 (A)
2552	100TH (A)	2631	352A (A)	2723	869B (A)
2553	101F (A)	2632	354A (A)	2733	3951 (A)
2554	111A (A)	2633	362A (A)	2734	4003A (S)
2556	117L7 (A)	2634	367 (A)	2735	4015A (S)
2557	117N7 (A)	2636	375A (A)	2743	4033AF (S)
2558	117Z6 (A)	2637	388A (A)	2746	4064A (A)
2560	121A (A)	2640	405BU (C)	2755	4251AX (S)
2561	122A (A)	2643	2C40 (A)	2756	4260A (S)
2562	164V (M)	2644	460BU (C)	2759	4304 (S)
2563	204A (A)	2645	506BU (C)	2760	4304B (S)
2565	2050 (A)	2654	715A (A)	2761	4304BB (S)
2566	205E (A)	2655	715B (A)	2765	4673 (S)
2567	205F (A)	2657	800 (A)	2768	8003 (A)
2569	210DET (C)	2658	806 (A)	2769	9006 (A)
2570	210HF (C)	2660	809 (A)	2800	A40 (C)
2571	210HL (C)	2661	812 (A)	2803	A915 (O)
2574	210VPA (C)	2663	815 (A)	2804	A915A (O)
2576	4C21 (A)	2664	822 (A)	2805	A924 (C)
2577	212E (A)	2665	825 (A)	2806	AC/2HL (D)
2579	218 (A)	2666	829B (A)	2808	AC/Pen (D)
2580	220C (C)	2668	846 (A)	2809	AC/5Pen (D)
2582	220VS (C)	2669	849 (A)	2811	AC/HL (D)
2584	231D (A)	2670	849H (A)	2813	AC/HLDD (D)
2586	240B (C)	2671	851 (A)	2815	AC/P (D)
2587	242C (A)	2672	852 (A)	2819	AC/S (D)
2588	244A (A)	2673	857B (A)	2822	AC/SG (D)
2589	250TH (A)	2674	863 (A)	2823	AC/SP3 (D)
2591	100TH (A)	2675	864 (A)	2830	AC/TH1 (D)
2592	256B (A)	2676	865 (A)	2832	AC/VP2 (D)
2593	257A (A)	2679	866JR (A)	2833	AF3 (P)

C.V. No.	Commercial Equivalent
2836	APP4G (T)
2839	AR300 (A)
2860	AZ1 (P)
2861	AZ2 (P)
2862	AZ31 (P)
2864	B21 (O)
2865	B30 (O)
2871	CAT6 (O)
2872	CAT9 (O)
2874	CK1005 (A)
2875	CL4 (P)
2887	DAC1 (M)
2889	DD620 (C)
2890	DDT (T)
2891	DE5 (O)
2892	DE5B (O)
2899	DET9 (O)
2900	DET10 (O)
2907	DF1 (M)
2909	DH73M (O)
2910	DK1 (M)
2911	DL2 (M)
2912	DL63 (O)
2925	EBF2 (M)
2926	EBL31 (M)
2927	EC50 (M)
2929	ECH3 (M)
2930	ECH33 (M)
2936	4B22 (A)
2938	EL33 (M)
2940	EL36 (M)
2941	EL50 (M)
2944	ESU1500 (E)
2945	ESU75 (E)
2946	ESU150 (E)
2947	ESU300 (E)
2948	ESU450 (E)
2949	F123A (A)
2954	FC2A (M)
2955	FC4 (M)
2956	FC13C (M)
2959	3B21 (A)
2960	FP54 (A)
2967	8020 (A)
2973	GU7 (O)
2977	H2 (O)
2978	H12 (O)
2979	H30 (O)
2981	H410 (O)
2982	H610 (O)
2985	HD24 (O)
2986	HD203A (A)
2987	HF100 (A)
2988	HF200 (A)
2989	HK354E (A)
2991	HL2 (O)
2996	HL41DD (D)
2998	HL133 (D)
2999	HL133DD (D)
3500	HL210 (O)
3501	HL610 (O)
3502	HL1320 (D)
3503	HLDD1320 (D)
3505	HY114B (A)
3506	HY615 (A)
3515	KB2 (M)
3516	KK2 (M)
3519	KT30 (O)
3520	KT31 (O)
3527	KTW73M (O)
3530	KTZ73 (O)
3531	L2 (D)
3532	L21 (O)
3533	L22DD (D)
3534	L30 (O)
3538	L610 (O)
3541	LS6A (O)
3546	MHD4 (O)
3552	MPT4K (O)
3553	MS4B (O)
3554	MPT42 (O)
3562	MSP41 (O)
3564	MT12 (O)
3567	MU1 (D)
3571	MVSPen (C)
3572	MVSPenB (C)
3573	MZ05/20 (M)
3574	MZ1/76 (M)
3576	MX40 (C)
3578	PM22D (M)
3579	PT5E (O)
3582	VP4B (M)
3587	705A (A)
3590	708A (A)
3593	713A (A)
3594	717A (A)
3599	829A (A)
3601	7193 (A)
3620	P220 (D)
3621	P410 (O)
3622	P610 (O)
3623	PA40 (D)
3626	Pen4B (M)
3631	Pen45DD (D)
3633	Pen231 (D)
3634	Pen428 (M)
3635	Pen1340 (D)
3636	Pen1346 (D)
3638	PenA4 (M)
3641	PM1HL (M)
3642	PM1LF (M)
3643	PM2A (M)
3645	PM2DX (M)
3647	PM22A (M)
3648	PM24E (M)
3649	PM22 (M)
3652	PT5 (O)
3653	PT6 (O)
3654	PT11 (O)
3655	PT425 (O)
3657	PVO5-15 (M)
3658	PV1-35 (M)
3667	RG1-250 (M)
3670	RG4-100 (M)
3672	RK28 (A)
3673	RK28A (A)
3674	RK31 (A)
3677	RK47 (A)
3679	RK49 (A)
3680	RK60 (A)
3683	RKR47 (A)
3688	2C33 (A)
3690	RZ1-150 (M)
3691	S23 (O)
3695	S215 (C)
3696	S215A (C)
3698	S610 (O)
3702	SG215 (C)
3703	SP4B (M)
3704	SP13C (M)
3715	SW5 (C)
3721	T4D (M)
3722	T20 (A)
3723	T41 (E)
3724	T200 (A)
3726	TDD2A (M)
3727	TDD4 (M)
3739	TX3-200 (M)
3740	TX5-400 (M)
3741	TZ2-300 (M)
3742	TZ20 (A)
3743	U5 (O)
3744	U6 (O)
3751	U21 (O)
3752	U30 (O)
3753	U31 (O)
3758	UR3C (M)
3759	UU4 (D)
3761	UU7 (D)
3787	VP2 (M)
3788	VP4 (M)
3790	VP13C (M)
3793	VP24 (D)
3794	VP210 (D)
3795	VP215 (D)
3796	VP1322 (D)
3798	VR75 (A)
3799	VR90 (A)
3800	VS2 (O)
3802	VS24 (O)
3803	VS24K (O)
3805	W30K (O)
3806	W31 (O)
3810	WD30 (O)
3816	X21 (O)
3818	X22 (O)
3819	X24 (O)
3821	X31 (O)
3823	X41 (O)
3825	X63 (O)
3830	XH1.5 (Q)
3831	XL2 (Q)
3832	XP2 (Q)
3833	XSG2.0 (Q)
3834	XW2 (Q)
3836	Z21 (O)

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